ENVIRONMENTAL AUDIT GUIDELINES FOR THE PETROLEUM INDUSTRY

Prepared for:

The Canadian Petroleum Association

A Joint Venture Project by:

Western Oilfield Environmental Services Ltd.

&

Affiliates:

Dominion Ecological Consulting Ltd.
Aquatic Resource Management Ltd.
Profit Matters Inc.
Ron Hickey, P.Eng.
Wishart Robson

CANADIAN PETROLEUM ASSOCIATION

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SECTION 1
ENVIRONMENTAL AUDIT OVERVIEW

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(I) Objective

The 1987 Canadian Petroleum Association (CPA) Environmental Code of Practice contains a commitment to achieve a consistently high level of environmental performance within the petroleum industry. In order to achieve this end, compliance with applicable laws and regulations is required throughout the industry. Environmental audits are one important component to the achievement of such compliance. "Compliance" applies to corporate policies, government regulations and industry guidelines to maintain order within a changing governmental regulatory environment. Earlier, the CPA had established Environmental Operating Guidelines to set out a general process for petroleum industry operators to follow.

In order to facilitate a process of continued compliance by industry with government standards, the CPA has prepared this document which sets out suggested Environmental Audit Guidelines for the petroleum companies which make up its membership.

The specific objectives of the project were:

- To provide upstream companies with a generic description of how to set up and undertake environmental audits of facilities and activities to ensure compliance with regulations and with company policies to minimize liabilities.

- To develop and describe the concept behind the Environmental Auditing process.

- To develop a practical "how-to" manual or User Guide which describes the overall concept and the Environmental Auditing process.

- To develop the Environmental Audit format which can, through a fault tree analysis be custom-designed to meet the specific criteria of a given facility.

- To develop an Environmental Auditing process which will ultimately allow environmental managers to monitor improvements (or decline) in compliance to the Environmental Code of Practice or environmental regulations.

- To develop a system which quantifies a company's or a facility's degree of compliance and the liability associated with non-compliance.

- To facilitate a Cost/Benefit analysis for environmental compliance.

As such, this work constitutes a generic guide for the establishment and implementation of a comprehensive Environmental Audit Program crafted for use by the upstream petroleum industry.

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Chairman	Mr. Michael Robertson	Petro-Canada
Members	Mr. George Collin	Petro-Canada
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I AN OVERVIEW OF ENVIRONMENTAL AUDITING

1. Definitions

The Oxford English dictionary gives several meanings to "audit", the most applicable here being: "Official examination of accounts with verification by reference to witnesses and vouchers - a searching examination or solemn rendering of accounts". Its most frequent use to date deals with financial auditing which entails the examination of financial statements and activities by certified accountants, although the term is increasingly applied in the context of environmental evaluations.

A.D. Little (1984) noted that the term has recently become associated with a wide variety of activities intended to examine the performance of an operation and establish the compliance status and environmental performance of operating facilities. Little (1984) also suggests that auditing is a methodical examination, involving analyses, tests, and confirmations of local procedures and practices leading to verification of compliance with legal requirements, internal policies and/or accepted practices. Reed (1984a) states that environmental auditing refers to internal, formalized, structured and rigorous procedures used by companies to monitor and provide feedback on the strengths and weaknesses of the various programs and activities they employ to protect the environment and public health.

The word auditing implies a level of precision and standardization which is quantifiable, but it is generally not possible in an environmental context. Thus, the use of the word "auditing" has led to some criticism and misunderstanding. However, while some corporations have deliberately avoided the term "audit", in order to eliminate confusion with financial or legal divisions, others have employed it in order to establish credible basis for such operations, especially with government enforcement agencies. Greeno et al., 1987, suggests that future environmental audits should be called "environmental evaluations" and that future audit programs will shift away from strict facility compliance assessment toward auditing the environmental management system.

Here, a prototype for future, specific environmental audits has been developed as a generic guide for petroleum industry operators. It must be recalled that there exist different methodologies for specific environmental audits, and these may differ in both scope and level of sophistication, depending upon such factors as risk, magnitude of development and attention from regulatory agencies. We do not intend to suggest that our methodology is the only option available for operators. Specific requirements will dictate the methodologies best suited for the needs of each operator and hence, we have referenced related literature which explores alternative strategies from the Canadian and United States' experience. Nonetheless, we have attempted to synthesize the conclusions of these studies with specific reference to the needs of a variety of operators in the Canadian upstream petroleum industry. As such, this

Guideline should serve as a useful first step in designing programs for environmental audits in a range of corporate applications for many different-sized operators.

2. Historical Perspective

Environmental auditing is based on, and follows, financial auditing procedures. Financial auditing is the evaluation of financial affairs, activities and management systems. Environmental auditing is the evaluation of environmental performance and compliance with regulations. This examination can either be internal (appraisal and analysis from within an organization) or external (independent, objective, examination from outside an organization).

Environmental auditing is a new and innovative form of management control which has arisen as a result of increased public concern for the environment, in the 1960's and 1970's, which resulted in the creation of many environmental laws. Subsequently, the petroleum industry began to recognize their social and legal environmental responsibilities. Environmental auditing provides a method to evaluate and verify that a petroleum facility is in compliance with environmental regulations for environmental protection performance. It follows that after the installation of pollution control devices, equipment and procedures that those devices will require ongoing modification and maintenance. The Canadian petroleum industry has been a recognized leader in the development of policies and procedures for environmental protection.

The goals and functions of environmental auditing have changed in the recent past. In many cases, they are not limited to measurement of environmental performance, but are used more as a method for management, education, training and communications (Reed, 1984b). Auditing has tended to become more pro-active with maturation in that standards can be set and may anticipate future hazards. Audits are still evolving as experience is gained.

In the United States, audit programs tend to stress compliance with existing regulations. An extensive list of industrial users of environmental auditing include companies from manufacturing, petroleum, chemical, pulp and paper, utility, automotive, steelmaking, Air Force, Department of Energy and the United States National Institute of Health (Reed, 1984b). Seminars, conferences, articles, and papers on environmental auditing are becoming more common. General interest is increasing and so are the number of firms and organizations that use auditing. The Canadian petroleum industry has recently begun to implement audit programs for facilities and petroleum complexes. These processes are becoming an increasingly important component of environmental management programs for the oil industry.

Canadian facility audits place more emphasis on assisting management and involving line personnel than do United States' programs. The Canadian audits examine other unregulated activities (employee training, emergency response, internal organization, general housekeeping, etc.) that affect environmental control and include chemical, manufacturing, petroleum, pulp and paper, automotive, mining, and steelmaking industries (J.W. Reed, 1984b).

A number of Canadian companies have effective environmental auditing programs in place. The Petroleum Association for the Conservation of the Environment (PACE) has provided leadership in auditing by conducting workshops and is supporting a program to identify performance standards which can be applied to auditing of refineries. The Canadian Petroleum Association (CPA) has approved an Environmental Code of Practice for their industry members which refers to, and recommends, member companies to conduct systematic environmental audits (Environment Canada, 1988).

Recent Canadian regulatory initiatives have accelerated the pace, and scope, of environmental audit implementation in the petroleum industry.

The Canadian Environmental Protection Act (CEPA) was formally enacted in June, 1988. This document refers to environmental auditing in the context of Environment Canada's role in promoting compliance with requirements of the Act. Environment Canada has four main objectives for achieving its goal of promoting environmental auditing through the CEPA:

1. To raise the level of awareness of environmental audits and their value among industry and the government of Canada.

2. To present the state of the art for environmental auditing in Canada, the United States and elsewhere.

3. To promote and encourage the use of audits for industry at federal and provincial facilities.

4. To more clearly define government and industry roles in the audit process.

These objectives can be met through any combination of the following:

- workshops;
- development of environmental auditing manuals or guides;
- presentations;
- seminar;
- audio-visual promotions;
- training aids and programs;
- federal/provincial government policy statements; and
- industrial commitment.(Environment Canada, 1988)

Under its recently enunciated Enforcement and Compliance Policy, Environment Canada notes that:

> "Environmental audits are internal evaluations by companies and government agencies, to verify their compliance with legal requirements as well as their own internal policies and standards . . . . audits can identify compliance problems, weaknesses in management systems, or areas of risk."

> "Environment Canada recognizes the power and effectiveness of environmental audits as a management tool for companies and government agencies, and intends to promote their use by industry and others."

Here, it is stressed that individual petroleum companies will have various options in the implementation of specific environmental audit protocols and procedures. Each company will have different requirements for such audit processes, which may have to be specifically designed to suit each users' needs. A discussion of audit philosophies or approaches is presented in Section 3.

3. Audits

3.1 Corporate Environmental Management Philosophies

The Canadian environmental legislative matrix is undergoing substantial change. These changes have been caused by an increasing public and political recognition of the need for heightened environmental protection and enforcement, at the federal and provincial level.

Member companies of the CPA have a direct, vested interest in continuing to stay abreast of such regulatory standards. Environmental audit processes are one important tool available to oil and gas companies to maintain a clear, managed approach to such requirements. Audits provide management with a concise, regular summary of environmental problems and risks attendant with ongoing field operations. They also provide a continuity of records and internal environmental surveillance-records which may be essential in establishing due diligence in future possible regulatory initiatives. The new Canadian legislation calls for heightened levels of responsibility for environmental controls from CPA member companies. These controls may usefully be serviced, or maintained, through an audit approach to environmental regulations/operations recognizing that each company will have to tailor these systems to the nature of their operations. In short, audit applications must be specifically applied to the needs of the users.

We have suggested an "Adaptive Audit" approach for CPA member companies, in order to ensure ongoing compliance with regulatory measures now, and in the future. While the levels of sophistication needed for specific companies and operations may differ, each company will have to ensure continued vigilance in maintaining compliance with environmental regulations.

The philosophy of corporate management determines whether an audit is conducted or not. Three general types of corporate philosophies are described below as examples:

A. Problem Solving

When in a problem solving mode, a firm's philosophy is often aimed at staying "out of trouble". This approach is set only to meet minimum requirements by undertaking action only on the most recognized environmental problems, the most pressing problems, where compliance is required with unavoidable laws and regulations, and avoidance of costly environmental incidents. Firms at this stage are not likely to conduct environmental audits, but rather conduct assessments of the plants potential environmental problems.

The responsibility for environmental concerns at this phase is at the plant level, with engineers and technical personnel trying to avoid environmental problems.

B. Managing for Compliance

This stage involves a more formal approach to environmental management for the main purpose of compliance. Policies and procedures are produced to ensure compliance. These firms tend to conduct audits which include assessment and verification of compliance. The scope becomes wider with objectives to observe all laws and regulations concerning the environment.

C. Managing for Environmental Assurance

At this stage all risks to the environment, not just those reflected in compliance with the laws, are addressed and managed. Greeno et al. (1987), describes this third phase as follows: "the principal focus is on building an environmental management system that emphasizes protecting internal resources and the external environment from injury by looking for and anticipating hazards as well as by managing consequent risks". The environmental audit becomes a part of a firm's risk management program leading to formalization of procedures and policies.

Personnel involved at this stage include persons from the corporate, division and plant levels. (Greeno et al. 1987; Harrison, 1984)

3.2 Potential Benefits

A brief summary, in point form, of some of the major benefits of facility audits is presented below. To realize any of these benefits, the audit process and audit plan, must be properly designed and implemented. The follow up and feedback activities are also an element in realizing these benefits:

- improved effectiveness of environmental management;
- increased involvement in day to day environmental activities;
- better corporate decision making;
- compliance with regulations;
- improved communications between all levels of a corporation;
- improved communications between corporations and government regulators;
- increased security in that risks have been reduced;
- higher employee moral;
- improved worker health;
- financial benefit of not having to pay enforcement fines;
- better and more accurate financial planning;
- provides evidence for insurability;
- protection from civil and criminal liabilities;
- improved public relations if there are no environmental incidents; and
- allows for environmentally sound acquisitions and mergers to take place.

It is obvious that if the Corporation realizes some of these benefits, the public sector may directly or indirectly be a joint beneficiary. This could be a major strategy for corporate public affairs groups and would certainly enhance the company's image as a good corporate citizen.

3.3 Uses of Audit Information

Facilities auditing does not attempt to gather baseline information, but rather is interested in operational data and whether that data complies with regulations in place. Facilities auditing is concerned with management practices which lead to compliance and environmental performance at the present and in the future.

Reed, 1984a, suggests that a facility audit can, if properly designed, provide the following:

- Facility auditing is a monitoring tool
    - it is a form of managerial control;
    - it monitors implementation of control, responsibility, authority, and accountability;
    - it evaluates the performance of operating facilities;
    - it acts as a check on day-to-day record-keeping, reporting, monitoring, training and maintenance; and
    - it results in sound corporate systems and procedures.
- Facility auditing acts as a review of environmental protection and compliance assurance activities
    - by providing a look at controls, programs, information, and procedures; and
    - by allowing gathering, evaluation, communication, and use of environmental information.
- Facility auditing assists facility management and assures corporate management
    - in that it provides an independent or "fresh look" at operations (by third parties or trained company personnel);
    - it provides a solid base for decision making; and
    - allows for verification of compliance with internal policy and external regulations.
- Facility auditing consists of assessment
    - through judgement or opinion relating to the adequacy and effectiveness of environmental concern; and
    - by judgement or opinion of existence or magnitude of environmental hazards.

- Facility auditing provides verification

  - through empirical testing of facility performance; and
  - it demands accuracy, compliance, adherence to corporate policy and procedures.

- Facility auditing provides follow-up

  - by requiring the development of action plans;
  - by implementation of those action plans;
  - by monitoring and evaluation of implemented action plans; and
  - through the communication of results.

- Facility auditing is a form of environmental protection if:

  - it increases the number and type of environmental deficiencies identified;
  - it increases the speed of corrective action;
  - it provides a mechanism by which effectiveness and appropriateness of implemented control measures can be evaluated;
  - it reduces the total number, severity and frequency of non-compliance incidents;
  - it improves the efficiency and effectiveness of pollution control equipment and facilities;
  - it adjusts and corrects inadequate practices or procedures;
  - it identifies and manages the environmental risks and the detection and prevention of environmental surprises or sudden events; and
  - allows for better preparation, anticipation and response to actual emergency and crisis situations.

The motivations for corporations to conduct facility audits are highly variable. The main motivation appears to be to determine and document compliance with regulations. Other motivations include the following:

- Main Functions Which Auditing Programs Fulfil (Reed, 1984a, 1984b)

  - assist facility management;
  - assure corporate management that environmental affairs are operating effectively;
  - improve communications;
  - determine current and future costs of compliance;
  - enable comparison between facilities;
  - identification and correction of compliance problems;
  - improve personnel awareness of environmental concerns, regulations, policy, practices, procedures and responsibility;
  - evaluation of existing training programs;
  - provide better preparation, anticipation and response to actual emergency and crisis situations;
  - identification of environmental risks and hazards and development of an action plan to control these risks;

- avoid liability and fines;
- increase efficiency of resources use;
- provide better environmental information before negotiations of mergers, acquisitions, and divestitures are completed;
- record corporate responsibility in management of environmental activities; and
- improve corporate image and enhance public relations.

3.4 Pertinent Canadian Legislation

3.4.1 Overview

Canadian environmental statutes are currently undergoing significant change. Ontario, for instance, has recently substantially enhanced its activities in environmental enforcement and the Federal government has recently passed major legislation on environmental protection. These activities have been paralleled in Alberta with unprecedented activities by citizen activist groups, who have invoked appropriate legislative mechanisms for environmental standards and protection, and by government commitments to tougher environmental enforcement. These trends indicate the potential value of environmental audits in preventing enforcement actions by regulatory agencies and in providing clear assessment guides for corporate managers involved in environmentally sensitive operations.

3.5 Confidentiality

In considering facility audits, corporations should also be aware that issues of confidentiality and public disclosure are matters which require further careful examination. Presently, the chance that confidential (audit) information may be released to the public, competitors or regulatory agencies may be a potential barrier to the widespread introduction to environmental audits.

It may be prudent to first seek legal opinion on the confidentiality of audit information which may be collected by internal, or external, personnel and the potential use of such data in subsequent regulatory actions. Until such time as there is a clear recognition by regulatory agencies in Canada of the proper use and application of audit data collected by participating corporations, legal advice should be obtained in the design and implementation of industrial audit procedures and reports.

Recent initiatives toward the criminalization of some environmental laws in Canada may lead companies to clarify reporting procedures for environmental audits. Companies must be prepared to deal with the possibility that audits may contain evidence of a breach of regulatory statutes and uncover information that is at odds with material previously supplied to regulatory agencies. This is an area where clear understandings between industry and regulatory agencies have yet to be achieved.

In any event, there should be clear and concise instructions for the audit team to follow with respect to the proper preparation, content and disposition of all working papers, reports and other verbal, written or recorded materials generated through the audit process.

4. ORGANIZATION, PLANNING AND CONDUCT OF AUDITS

4.1 Overview

The success of environmental audits will depend, to a great extent, upon the basic organization and planning behind each phase of the process. Here, the conceptual steps necessary to implement a successful environmental audit program are outlined. Eight basic steps are described as essential to the design and delivery of an audit process:

1. Direction from Senior Management
2. Audit Planning
3. Pre-Audit Activities
4. Conducting the Audit: On-Site Work
5. Evaluation: Subsequent Review and Analysis
6. Audit Reporting
7. Follow-up to the Audit Results
8. Auditing the Audit Process.

4.2 Direction from Senior Management

It is essential that senior corporate management require the implementation of adequate, clearly accountable, audit procedures. Standards must be set against which the results of audits may be judged and corporate performance evaluated. Early attention will be required in order to set appropriate corporate standards for accountability and control.

Senior managers will have to assign responsibilities for the management of environmental audits to designated management, or audit teams who, in turn, must carefully follow the corporate terms and objectives. In short, there must be clear corporate objectives set against which audit results may be judged. Greeno et al. (1987) extensively discuss this topic, related to the fulfilment of management objectives through the proper definition of program goals.

4.3 Audit Planning

After confirming corporate expectations and establishing program objectives, corporations should proceed to develop an audit plan. This plan should be responsive to both external (regulatory) and internal (management) needs because:

(a) The Canadian environmental regulatory climate is in a process of significant change.

(b) It is crucial to have in place procedures which are responsive to both the changing requirements of government and to the internal needs of the corporation. It is also important for corporations to be perceived by the public-at-large as being conscientious and progressive institutions in their practices of environmental protection.

Undoubtedly, corporate priorities will determine both the level and magnitude of requirements for environmental audits. These priorities will change relative to corporate perceptions as to risks resulting from field operations/facilities and the degree of legal accountability required by regulatory agencies. Hence, environmental managers must be responsive to corporate needs in determining the degree to which auditing is carried out and the urgency which the results are reported to appropriate line-managers or corporate officers.

This a difficult role for any environmental manager to fulfil. On the one hand, line-managers may perceive such audit functions as an intrusion into the day-to-day management of highly sophisticated facilities. Internal "policing" functions could be perceived as a significant treat to operational personnel. On the other hand, clear threats to the corporation which may be identified through an environmental audit process must be dealt with in a serious and effective manner. Clearly, cooperative approaches by all operational and environmental staff members is the desired alternative. Hence, environmental audit procedures are subject to influences from:

(a) Managerial and organization structures; and

(b) Operational training and managerial effectiveness.

Hence, it is appropriate for environmental audit groups to establish a service-oriented approach to senior corporate officers and their line organizations. Similarly, the need for such audits must be recognized by senior management as one essential source of information for the corporation.

The ultimate objective of any audit process will be to provide companies with a means to measure compliance with environmental regulations and anticipate exposure from non-regulated activities. It can also be used to gauge success of remedial methods aimed at meeting compliance. Hence, compliance should be measured not only at an individual facility at a given point in time, but throughout facilities across the operational spectrum of the corporation. Also, managers will have to assess trends shown by successive audits to ensure full vigilance in maintaining compliance with environmental regulations.

The audit process has three components with which to measure facility compliance:

A. Audit Consistency

Each environmental audit must rely on comparable methods and procedures for reporting if long-term measures are to be obtained. Such consistency will also provide operations and management personnel the opportunity to develop an historic record of ongoing facility compliance, both within, and between, sites.

B. Audit Continuity

Should regulatory actions commence, or be considered by government, the continuity provided by regular facility audits may be an important component of a legal defence strategy. "Due diligence", or a demonstration of long-standing environmental protection, may discourage regulatory agencies from punitive action, or may appeal to judges who are charged with hearing evidence. Hence, a measure of corporate compliance over time is an important internal and external management tool.

C. Corporate Compliance

Corporate managers need understandable and accessible measures of facility compliance, especially in corporations with extensive system components. Summary reports, which point to regular, or unusual, non-compliance situations, could become an important management tool for corporate management or legal staff. Quantitative processes for audits provide ongoing comparisons between facilities and with historical records between sets of facilities. This should provide for adequate warnings so that management corrective actions can be set in motion well in advance of regulatory actions.

The audit management may now be in a position to consider the selection of an auditing staff. There are two basic approaches, an internal auditing team and an external (or third-party) auditing team. Internal auditors offer the advantages of familiarity with company operations, maintenance of confidentiality and incorporation of audit experience into continuing company environmental programs. However, external auditors have more independence that can result in more complete coverage of sensitive issues and may ensure rigor in these assessments. While the benefits of using internal auditors are significant, there is merit in using external personnel on a regular or less frequent basis.

The selection of the appropriate audit team will be influenced by the factors noted below:

- The team leader should meet the following criteria:
  - experience in environmental management,
  - experience in functional areas,
  - general familiarity with facilities operations, and
  - supported and respected by management, the audit team, and facility personnel.
- Should a lawyer be a member of the team?
- Careful selection of a technical manager to collect information.

•Determine the required experience of the staff.
•Determine levels of training.

Before an audit is initiated it is of vital importance to develop a considered "audit plan" in order to achieve results which will be useful and understandable to affected individuals within the corporation. Vital findings of an audit, if misdirected, do not serve the best interests of the corporation and may constitute a future liability should an accident result from reported, but uncorrected, problems. Hence, proper coordination between operational and management components is vital to the overall success and application of the audit.

A.D. Little (1984) set out six basic steps in the development of an audit process:

1. Understand internal management systems and procedures.

2. Assess strengths and weaknesses of internal controls.

3. Gather audit evidence.

4. Evaluate audit findings.

5. Report audit

6. Audit follow-up.

While substantial experience, and data, from the United States history in environmental auditing is available, the reader is alerted to the fact that the Canadian legislative base is significantly different from the American's. Hence, judgement will be required in the exercise and implementation of audit procedures in Canada.

4.4 Pre-Audit Activities

As discussed earlier, facility audits are not designed to collect baseline environmental or process data. Initial facility audits must rely on a baseline or pilot survey of the facility that:

1. Contains a summary of historical records of:
   •facility processes;
   •produced products;
   •produced wastes;
   •underground storage sites;
   •underground disposal sites;
   •other waste disposal data;
   •spills of oil or hazardous chemicals;
   •media reports; and
   •possibly interviews with long service employees;

2. Includes an inventory and documentation of existing plant characteristics, facilities, unit processes, substances, internal control (management and engineering) and facilities layout;
3. Has a summary of applicable regulations, licences and permits; and
4. Contains information on current and past monitoring programs and compliance records.

Baseline, or pilot survey information, should be collected from available sources before the field audit, rather than from a pre-audit site visit or inspection.

For subsequent audits the baseline survey could be updated. The audit design would then be based on changes in the process as described in the revised survey, the results of the previous audit, and other internal or external forces which are likely to impact the audit program.

This approach works well for permanent facilities. However, for seasonal or mobile operations (seismic and drilling would be two applicable examples) it is not suitable. A pre-audit questionnaire based on experience with previous programs and site specific environmental concerns would be more applicable.

Regardless of the type of audit or facility being audited, the auditors should also assemble:

- copies of all applicable corporate polices, procedures and guidelines;
- a summary of internal communication routes and practices to determine if the flow of information is accurate;
- a review of internal mechanisms, and management procedures; and
- copies of current contracts, leases and perhaps labour agreements, and appropriate permits, licences or regulations for operations.

The type of information collected is a direct function of the scope and type of audit. It is not the intention of this overview to present all the possible types of data that could be assembled. If the audit objective is regulatory compliance the audit team members will collect the necessary source materials and verify it through appropriate documentation. If the objective is to audit liability, performance and exposure, a completely different approach is usually taken to data collection and assessment. In both cases the auditors will rely on specific formats (questions) that have been developed based on the scope of the audit, depth of review and the type and level of audit technique.

4.5 Conducting the Audit: On-Site Work

Work on-site should be directed toward:

- verification of information collected in preparation work;
- examination of problems identified by the initial information gathering in the pre-audit activities above;

- identification of deficiencies not uncovered during preparation work; and
- documentation of existing environmental controls.

There are three basic types of information, or data, that can be gathered during an on-site evaluation, that will be the basis for evaluating environmental management and performance (adapted from Greeno et al., 1987). They are:

Physical data is evidence obtained by seeing or touching, it does not provide information of whether something is operational or not.

Documentary data is that which is visible by its paper trail (ie) photographs or monitoring results.

Circumstantial data is gathered indirectly.

This evidence will be acquired through:

(a) Observations - The use of on-site physical examination is without question, the most reliable source of data in the audit process. Hence, the training and background of the auditor will significantly shape the outcome of the audit and the quality of the results so reported.

(b) Inquiry - The auditor seeks on-site or follow-up data in discussions with field, facility or management personnel, once again, training and abilities of the auditor will be vital to the quality of data so obtained

(c) Verification - The auditor may require subsequent or on-site tests to verify the degree to which pollution-control equipment or procedures are functioning. Verification may extend to the methods used in documenting system performance through to site-specific testing of contaminants.

Clearly, the scope and validity of any audit program will be determined by the degree to which each of the factors noted above is utilized. An audit based solely on physical evidence collected by observation will be less valid than the same audit using observation and verification. Each audit program must be a function of the objective sought, the degree and magnitude of environmental liability and the verification procedures authorized by management. It should be borne in mind that auditing should strive to achieve its measures against specific, measurable, performance-based standards.

As a rule, the auditors should have a set of protocols, questions and directions, specific to the activity or facility they intend to audit. In the conduct of the audit they will assess environmental performance by examining:

- Policy - Are policies for compliance available? Is there evidence that facility personnel are aware of and understand the policies, as they relate to their particular duties?

- Regulations - Does the facility know and comply with all company, local, provincial and federal laws and regulations? Are copies of these regulations readily available? Are implications for non-compliance understood and are permits current with copies available?

- Plant design and operations - Is all environmental protection equipment installed and performing well enough to comply with regulations and is the equipment technologically advanced to provide the best protection available? (This latter concern may be beyond the expertise of environmental auditors, and stresses the need for teamwork by a group of professionals involved in the audit.)

- Operating procedures and practices - Are written operating procedures including emission, effluent and solid waste limitations as required by regulations and standards in existence, understood and followed?

- Maintenance - Does maintenance provide prompt corrective action to equipment deficiencies which result in environmental risk?

- Source monitoring - Are quantities and qualities of wastes and emissions from facility operations monitored regularly and is the status of compliance demonstrated through these monitoring programs?

- Monitoring of effects of emissions and wastes on the environment - Is the monitoring program effective? How often are samples taken, and have appropriate remedial actions been taken?

- Spill contingency measures - Are written up to date responses to procedures including contingency plans and resources covering incidental discharges available, accurate and easily implemented?

- Incident reporting and remedy - Are reports detailing incidental discharges, follow-up activity and corrective actions to prevent recurrence prepared?

- Environmental training - Is there awareness of implications of the operations and how effective is the information flow (access to technical literature, publications, and education programs)?

- Contractor selection and performance - Are contractors aware of company policy? Do they have a good environmental record? Are responsibilities clearly defined and does the company hiring contractors monitor the work preformed?

- External communications - Is there a system set up to deal with complaints and requests for information from external sources?

- Education and training - Who is trained, frequency and method of training?

- Environmental programs - What special past, present and future programs does the facility have for unique problems?

The auditors may participate in an "exit meeting" at the conclusion of the on-site activities to discuss the preliminary findings of the team.

All notes taken during the audit are called working papers. These working papers document the information gathered and should include enough information to substantiate the findings of the audit. The following information (Greeno et al., 1987) should be contained in the working papers:

- description of the in place management systems often accompanied by the use of flowcharts;
- description of the audit methods and actions taken to complete the protocol; and
- a summary of the auditor's findings and the conclusions reached for each step of the audit.

4.6 Evaluation: Subsequent Review and Analysis

The review and analysis of audit results will be conducted in a manner consistent with the type of report or reports to be generated. The responses solicited by the protocols should be in a format that simplifies analysis and presentation.

The audit team may conduct a:

1. Review of information:

Administrative review - examination of administrative actions required for compliance;

Technical review - examination of the adequacy of testing and sampling methods, effectiveness of spill prevention and efficiency of pollution control devices and overall environmental performance; and

Policy and practices review - to identify possible causes of non-compliance.

2. Analysis of findings:

- adequacy of practices, past, present and future environmental compliance issues and any other areas of concern;

- identification of all assets (areas of compliance and good environmental performance) and liabilities (non-compliance and poor environmental performance); and

- •liabilities should undergo risk assessment and include the following:
  - -estimate of the likelihood of suits alleging personal injury, property damage or nuisance;
  - -estimate of the likelihood of future regulation;
  - -estimate of the severity of the problem in relation to human health; and
  - -estimate of the corporate financial exposure.

3. Economic analysis of environmental liabilities including estimates of:

   - •costs incurred to date;
   - •costs of alternate remedial compliance; and
   - •alternate cash flow projections for planning flexibility.

It should be recognized that many auditors may not be in a position to make detailed, specialized evaluations. Management may consider that audit teams made up of a range of skilled professionals might be tasked with problem identification at site locations. The resolution of problems so identified may require examination by facility, or senior management, and may require economic and policy analyses.

4.7 Audit Reporting

The next key component is the reporting of data and analyses to specified management components which, in turn, has defined responsibilities and action-plans for appropriate responses (Figure 1). These, in turn, lead to follow-up assessments of compliance at the operational and management levels.

The audit team may prepare a formal, written report, some of which may follow pre-arranged format, or report, guidelines. Reviewers may subsequently include site, or area, managers, and personnel from departments as diverse as environment, engineering legal and administration.

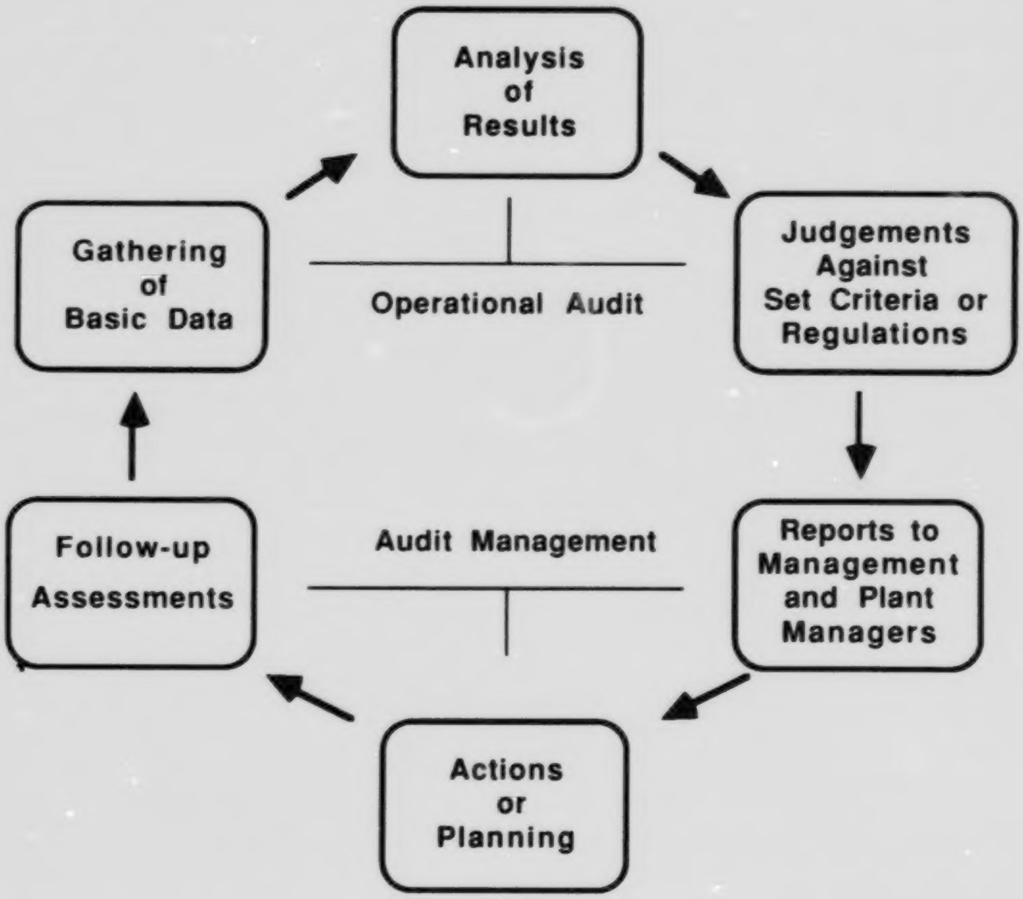
The audit report is produced to provide information to management on the findings of the audit, to initiate corrective action or action planning, and to provide documentation on audit findings (Greeno et al., 1987). The report must be clear and concise with all statements backed up with solid evidence. Dramatic and exaggerated terminology such as "gross negligence, reckless, deplorable, or alarming" should be avoided. The purpose of the audit will vary between companies, depending on the structuring of the overall audit process and the end-products of the audit.

The report should cover all aspects of audit planning, conduct and assessment, and the following considerations are typically addressed:

- •background information including objectives of the report and audit and methods used;
- •overall effectiveness and specific deficiencies of environmental control;
- •current compliance status;
- •potential risks and emerging problems;

Figure 1:

A Conceptual Audit Process


Analysis of Results
Judgements Against Set Criteria or Regulations
Reports to Management and Plant Managers
Actions or Planning
Follow-up Assessments
Gathering of Basic Data
Operational Audit
Audit Management

COMPONENTS OF THE AUDIT PROCESS

- Development Performance Standards (General & Site-Specific).
- Measure facility against standards.
- Identify Action Plan to correct deficiencies.
- Conduct follow-up checks to ensure corrective measures are effective.

- adequacy of training of plant personnel:
- adequacy of emergency response training;
- permit status of the facility;
- general housekeeping concern;
- good practices at the facility;
- lists of non-compliance; and
- recommendations to improve environmental procedures.

Recent initiatives have included a summary of external and internal forces that will affect operations in the near future. Changes in regulatory standards, enforcement policy, public perception or corporate philosophy, where they can be anticipated, can be built into the audit process to determine their relative impact on the company's current business practices.

The data and assessment reports generated during and after the audit may be presented to the various operations and management levels involved in the review of audit findings. Table 1 is an example of a type of distribution plan that could be prepared to aid audit management (Greeno et al., 1987).

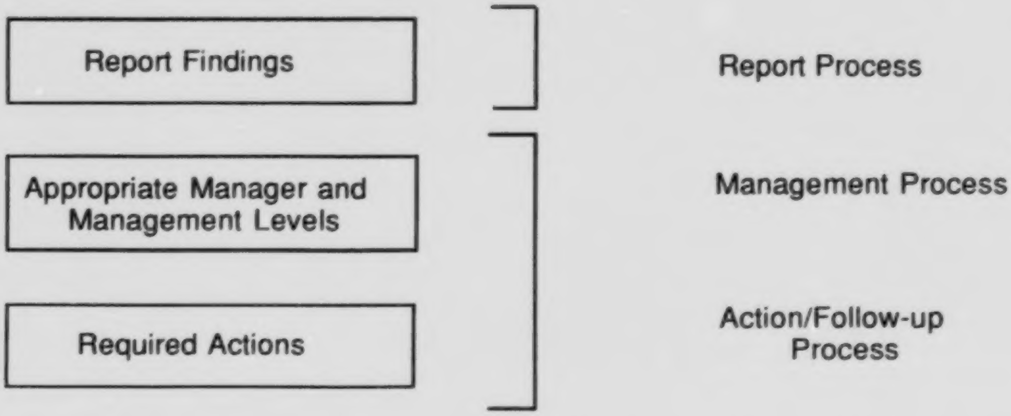
Table 1 Distribution of Audit Results
Source: Greeno et al., (1987)

WHO	WHAT	WHEN	HOW
Facility environmental staff	all deficiencies noted	when noted	orally throughout audit
Facility manager	all deficiencies noted	periodically and at exit meeting	orally and written
Corporate/division environmental	deficiencies not locally correctable	conclusion of audit	orally and written
Operating management	most significant matters	conclusion of audit and periodic	written report
Corporate management	general program status	periodically during the year	orally and written reports

Some companies will have their preliminary report completed before they leave the facility with the final report to follow. Generally, the audit report should be ready within one to three weeks after the completion of the audit and the final draft should be completed about two weeks later. An executive summary of the findings could also be prepared and circulated to senior management in order to ensure proper notification for executives throughout the corporation.

4.8 Follow-Up to the Audit Results

Clearly, the follow-up actions to the audit process represent a vital component of an overall management plan for environmental protection and corporate compliance. An audit which identifies specific problems which are not acted upon is a significant, potential corporate liability. Therefore, action planning for follow-up activities is an essential component to long-term management and compliance objectives. In short, the concept of "due diligence" is valid only if proper corrective actions are initiated after audit findings are reported.



The key to success is to assign specific follow-up responsibilities to individuals within appropriate management, environmental, legal or operational divisions of the corporation. The auditor may also play an important role in suggesting remedial activities and in providing ongoing assessment of the success of activities aimed at correcting identified problems. The auditor could also play a role in setting priorities for the corporation in dealing with various follow-up activities. This management system, in turn, may provide an important measure of system/facility operations and compliance and may provide vital indications of personnel or technological sources of problems within the operations. Properly assessed, such an overall management system could be essential to the improvement of efficiencies in the system and to the use of alternative technologies at specified facilities.

In summary, proper follow-up procedures will ensure that:

- non-compliance receives prompt and due consideration;
- action plans are the correct solutions to problems encountered; and
- action planning and follow through are achieved.

4.9 Auditing the Audit

"Auditing the audit" to assess the strengths and weaknesses of the audit procedures is an important step in determining the success of the auditing procedure. Auditing effectiveness and efficiency can be determined by asking the following questions:

- Did the audit perform its intended purpose?
- Was the audit team correctly selected to meet the goals of the audit?
- Was there sufficient cooperation from on-site personnel?
- Which, if any, auditing procedures or practices require modification?
- Were information gathering mechanisms satisfactory?
- Which procedures developed and refined as a result of this audit are applicable to other sites?
- What went particularly well during this audit?
- What did not go particularly well during this audit?

This process can be accomplished in several ways. Company personnel not involved directly with the audit can assess the program, or the facility personnel can assess it by completing a questionnaire. Also outside consultants can be used to assess the audit process and its findings.

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SECTION 2
ENVIRONMENTAL AUDIT USER GUIDE

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4.0 Computer Guide for the Environmental Audit Guidelines

Figure 1 - CPA Environmental Audit Directory
Figure 2 - Environmental Audit Flow Diagram

1.0 User Guide - Introduction

The Environmental Audit Guidelines prepared for the Canadian Petroleum Association addresses:

1. The CPA Code of Practice
2. References on environmental management such as the CPA Environmental Operating Guidelines (which cites regulatory agency directives and guidelines), and allow for the insertion of future references.
3. A systematic method of conducting Environmental Audits at a variety of upstream and downstream petroleum operations and facilities, that supports consistency and continuity, and evaluates corporate compliance to existing environmental protection standards and regulations.

The User Guide is the second section of the CPA Environmental Audit Guidelines. The first section, "An Overview of Environmental Auditing", provides background information for management. And the third section, "Protocol", lists the questions necessary to collect the environmental data (both field and office) for evaluating a company's environmental affairs. The three sections and their contents are diagrammatically represented in Figure 1: CPA Environmental Audit Directory.

2.0 How to Use this User Guide

An overview of the auditing process and its basic steps are illustrated in Fig. 2: Environmental Audit Flow Diagram. The contents of this guide are arranged chronologically, matching the auditing process and follow the Flow Diagram.

There are eight steps to auditing:

Step 1.	Direction from Senior Management
Step 2.	Audit Planning
Step 3.	Pre-Audit Activities
Step 4.	Conducting the Audit
Step 5.	Evaluating the Audit
Step 6.	Audit Reporting
Step 7.	Audit Follow-up.
Step 8.	Auditing the Audit

Figure 1:
CPA Environmental Audit Directory

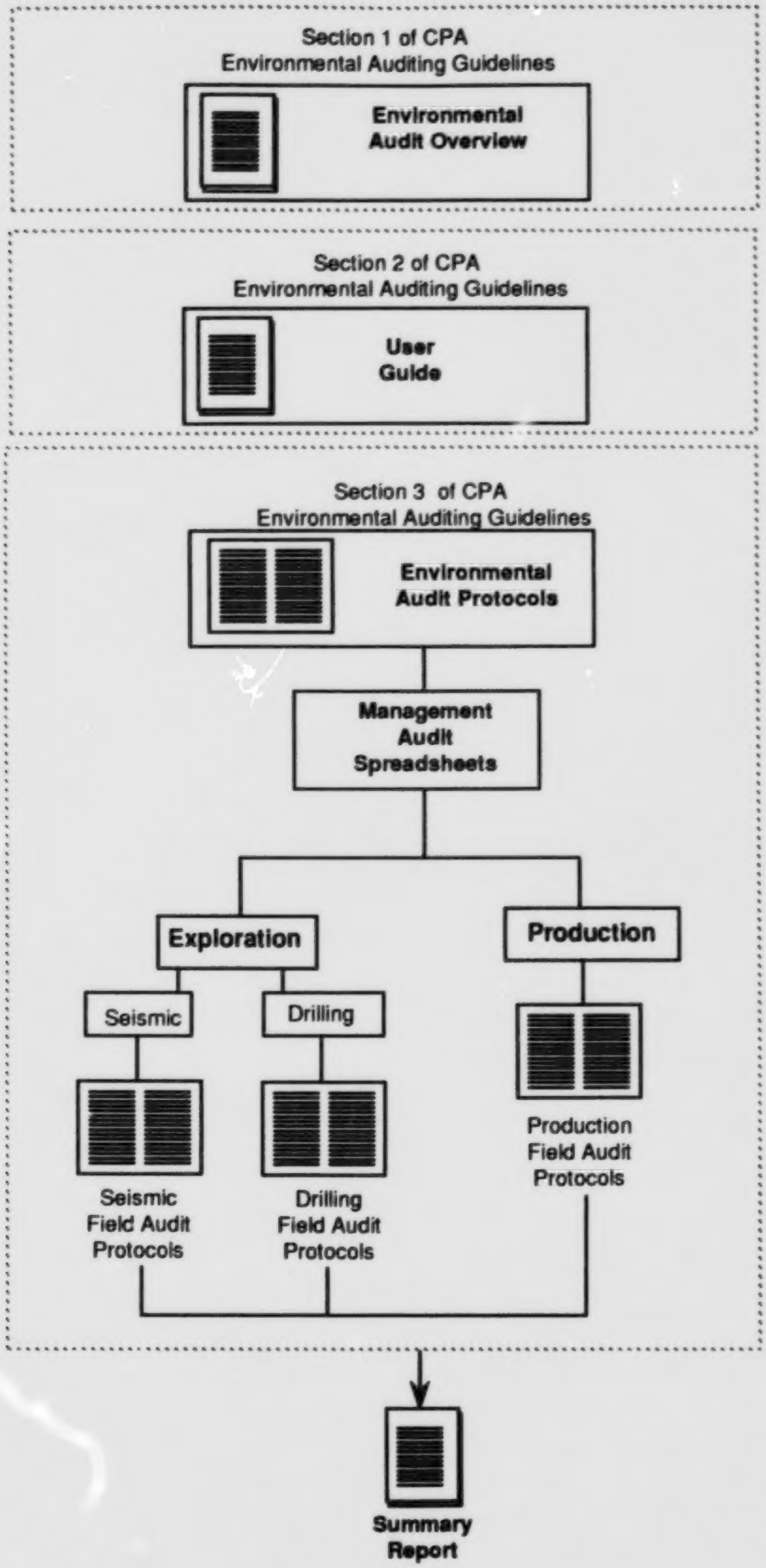
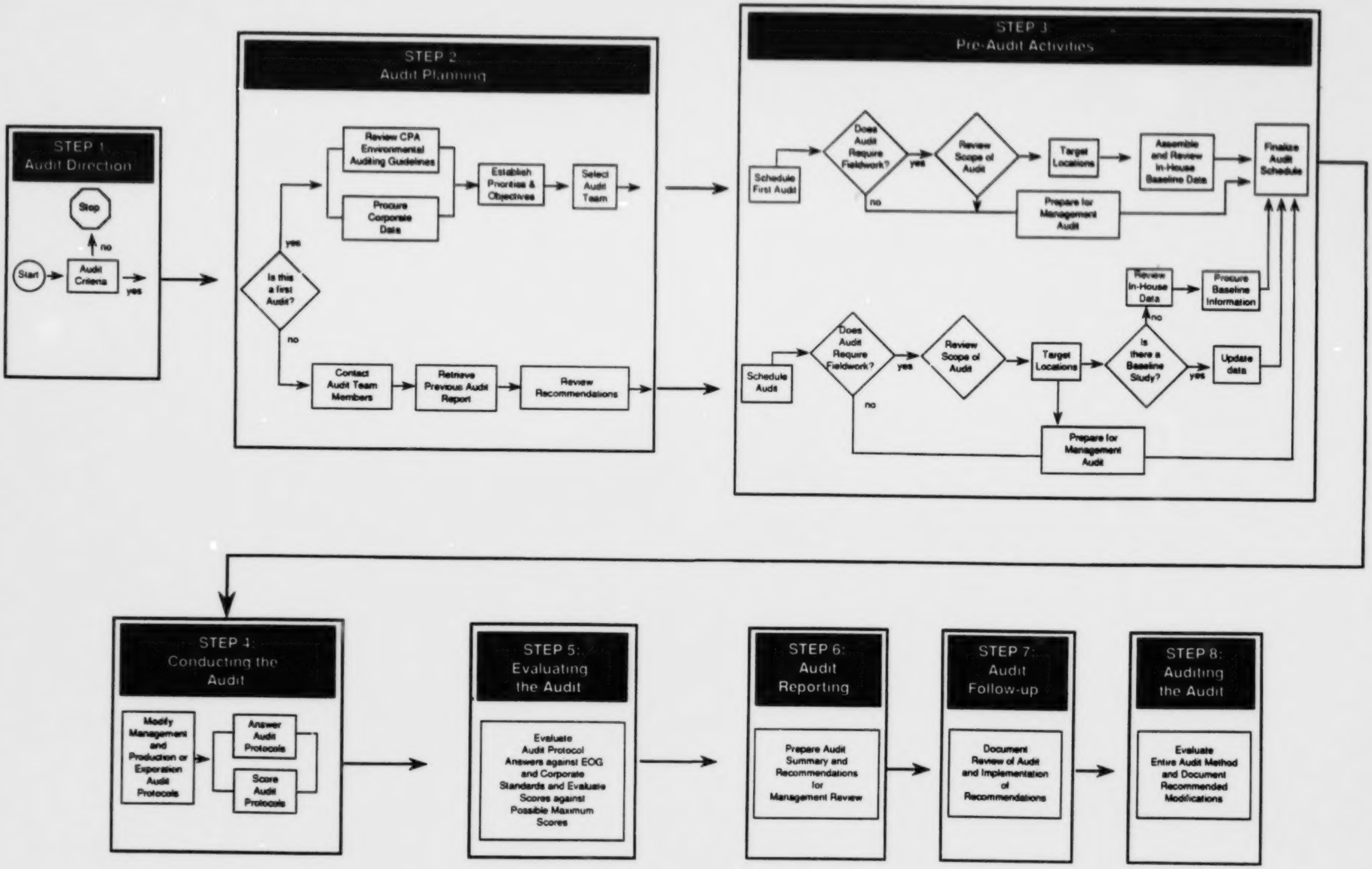

Section 1 of CPA
Environmental Auditing Guidelines
Environmental
Audit Overview
Section 2 of CPA
Environmental Auditing Guidelines
User
Guide
Section 3 of CPA
Environmental Auditing Guidelines
Environmental
Audit Protocols
Management
Audit
Spreadsheets
Exploration
Production
Seismic
Drilling
Seismic
Field Audit
Protocols
Drilling
Field Audit
Protocols
Production
Field Audit
Protocols
Summary
Report

Figure 2: Environmental Audit Flow Diagram


STEP 1 Audit Direction
Start
Audit Criteria
no
Stop
yes
STEP 2 Audit Planning
Is this a first Audit?
yes
Review CPA Environmental Auditing Guidelines
Procure Corporate Data
Establish Priorities & Objectives
Select Audit Team
no
Contact Audit Team Members
Retrieve Previous Audit Report
Review Recommendations
STEP 3 Pre-Audit Activities
Schedule First Audit
Does Audit Require Fieldwork?
yes
no
Review Scope of Audit
Target Locations
Assemble and Review In-House Baseline Data
Prepare for Management Audit
Finalize Audit Schedule
Schedule Audit
Does Audit Require Fieldwork?
yes
no
Review Scope of Audit
Target Locations
Is there a Baseline Study?
no
Review In-House Data
Procure Baseline Information
yes
Update data
Prepare for Management Audit
STEP 4: Conducting the Audit
Modify Management and Production or Exploration Audit Protocols
Answer Audit Protocols
Score Audit Protocols
STEP 5: Evaluating the Audit
Evaluate Audit Protocol Answers against EOG and Corporate Standards and Evaluate Scores against Possible Maximum Scores
STEP 6: Audit Reporting
Prepare Audit Summary and Recommendations for Management Review
STEP 7: Audit Follow-up
Document Review of Audit and Implementation of Recommendations
STEP 8: Auditing the Audit
Evaluate Entire Audit Method and Document Recommended Modifications

3.0 Steps in the Auditing Process

STEP 1: Audit Direction

Direction from Senior Management

In recent years, increased public awareness has put pressure on the governments to enforce environmental compliance on industry. In April 1988, Alberta Environment passed its Hazardous Wastes Management Act and in July 1988, Environment Canada passed its Canadian Environmental Protection Act. While regulatory enforcement is pending, the Canadian Petroleum Association took the initiative to set up its Environmental Code of Practice in 1987, anticipating an era of more stringent environmental regulations.

Environmental auditing is one federal policy that is being promoted to determine if industry is violating the act or committing an offence. Companies may decline compliance. They seriously must evaluate their risk. The penalties are severe.

As a tool to assess an operator's environmental status, the environmental audit also has managerial merits. It assesses operating performance, identifies future problems and remedies immediate ones. Auditing also serves an an educational and training device, ensuring that employees are informed of adequate environmental regulations and protection procedures.

The decision to audit rests in the hands of management. Criteria include:

- size of the operations and what effect it has on the environment;
- its risk in being involved in litigation;
- the role the operator has played in the community and how the public feels about its presence; whether favourable or not;
- the location of its operations, whether it is close to nearby environmentally-sensitive areas;
- if current operating procedures adequately address environmental issues;
- its corporate policies and priorities;
- cost, time and energy required to conduct the audit; and
- the regulatory environment.

STEP 2: Audit Planning

For initial (first-time) audits, management should establish their priorities after reviewing environmental auditing guide-lines and in-house corporate data. (For subsequent audits: call upon former team members, replacing individuals, if necessary. Upon retrieval of the last audit report, they should review their recommendations.)

Management should address maintaining audit consistency within an organization and from one year to the next. As a result of a company being potentially responsible for a wide range of exploration and production activities, the composition of the auditing team is likely to change. But continuity should be maintained by choosing the same individuals to lead the on-site audit; since considerable professional judgement is necessary.

Auditing needs to be conducted in a manner that does not upset day to day operations. It should not be interpreted as a "witch hunt". While outside or contract personnel may be necessary, the audit team should bring knowledge and skills that address:

- familiarity with the federal, provincial and municipal regulations for construction, operations and abandonment of the facility;
- rapport with the operations personnel;
- familiarity with corporate policies and procedures;
- good presentation and communication skills;
- access to historical or background data;
- knowledge of micro-computers and use of a spreadsheet.

Auditing is an iterative process. For initial audits, company personnel may be preferred. But subsequent audits, after in-house modifications, can be adapted for contractors or consultants.

A hypothetical auditing team can include the design engineer, the district or project supervisor, area operator and environmental/risk/safety professionals. In smaller companies, the auditing ream may consist of the operations engineer and a technician. In larger companies, the environmental managers may delegate the team's responsibility to regional environmental specialists, who then in turn will select a team.

The administrative support staff should be identified and briefed as to their duties.

STEP 3: Pre-Audit Activities

With the auditing team in place, members then need to decide when they should audit, the priorities in conducting the audit whether they be management, exploration or production or all, and review of background data. Following the acquisition and analysis of data procured in-house, the team is in a position to finalize their schedule. The team's auditing priorities, time, manpower and budget constraints will all influence pre-audit preparation. The last part in this step is putting the auditing tools in place by modifying the protocol.

Scheduling the audit will be influenced by:

- Type of audit:
    - Management Audit -- conducted in-house through verification and documentation.
    - Exploration Audits -- coincide with drilling and seismic programs and will require field visit(s); logistics in traveling to remote or difficult access locations.
    - Production Audits -- field visit scheduling should consider such activities as plant turn-around schedules, product loading operations or de-commissioning schedules.
- Seasonal factors: summer, fall and spring are suggested optimum auditing times (in this order) for production facilities; no constraint on exploration audits except spring thaw and major holidays, e.g. Christmas.
- Operating schedules of key field personnel.
- Team's auditing objectives and priorities: depend on facilities or contractors identified with poor operating records, potential or realized occupational health and safety problems as demonstrated in lost revenues, uncontrolled emissions or spills and high accident records; time, manpower and budget constraints.
- Availability of auditing personnel and support staff.
- Frequency that will depend on the complexity of the auditing program.
- The experience of the audit team, subsequent audits will take less time.
- Subsequent audits; to account for seasonal differences from year to year, subsequent audits should occur at the same time of the year for comparative purposes.

The background data to be reviewed before auditing includes:

- Management Audit -- corporate policies and procedures, changes in regulatory environment.

- Exploration Audit -- involves a wide range of activities from construction to reclamation: drainage and reclamation, mud systems, sweet vs. sour gas drilling, permafrost considerations.

- Production Audit -- operating history/records: media reports, spills, wastes disposal, physical descriptions, material balances and processing conditions, monitoring and other baseline data.

Note that the background data for the Management Audit is applicable to both exploration and production. The time it takes to review background information depends on the audit team's familiarity with the audit process and topics to be addressed.

Before pre-audit data on Exploration Audits can be gathered, the team must target its location (with the exception of wells being drilled from a pad location) for multiple well programs. In this instance, it may not be feasible to audit all operations that occur simultaneously. Targeting could be based on:

- primary contractor, (assuming more than one primary drilling or seismic contractor);
- specific program components, such as mud systems, sweet vs. sour gas, permafrost conditions; and
- site's potential for liability or its visibility.

Procuring data involves the following:

- Management Data (also relevant for exploration and production audits) Corporate data can be acquired in-house, regulatory information gathered from federal and provincial authorities, copies of current contracts, leases, labour agreements, permits and licenses.

- Exploration Data --In-house baseline data first; if not available, send out a pre-audit generic questionnaire to the drilling and seismic supervisors/contractors.

- Production Data -- from in-house and operating field records; if not available, send out a pre-audit questionnaire to the production supervisor.

With subsequent audits, there should be adequate baseline data from studies conducted previously. Up-dating the data could involve making calls to the field or sorting subsequent corporate records (in-house and field).

With all the pre-audit data in place, the schedule can be finalized and the software protocol adapted for corporate use.

STEP 4: Conducting the Audit

The environmental audit spreadsheets utilize the most common audit format, that is, asking questions or "protocols" and scoring them numerically.

Conducting the audit is a pragmatic process where the audit team answers questions or "protocols" and scores the answers. This is completed by:

- Modifying the protocols to suit individual corporation use.
- Answering the protocols by reviewing baseline data, interviewing key personnel and by site inspection, and
- Scoring the answers and calculating totals for each category.

The computerized spreadsheet format for the "protocols" allows for ease of information entry and modification of protocols by deletion of rows or columns, and for automatic calculation of scores.

Conducting the audit simply involves answering the appropriate questions and entering their scores onto the spreadsheet. This can be done on a personal computer or on paper.

The organization of the Audit System as shown in Figure 1: CPA Environmental Audit Directory, is described below:

- **Management Audit** -- addresses the completeness of management's corporate philosophy on environmental management and planning. Designed to be completed in-house prior to field audits, the size of the facility to be audited may require administration involvement at the district or regional level. It is imperative that the senior company management personnel contribute to the audit process. All Management Audit Protocols are to be answered or attempted, which are sub-divided into the following sections defined within a numerical series:

100	Policy and Procedures
200	Programs
300	Organization
400	Personnel

- **Exploration Audit** -- covers Seismic and Drilling activities. Protocols follow the chronological order of a field program, as much as possible. Consider the sequence of events from acquiring drilling and construction licenses and permits, to completion of all construction work and final reclamation.

Seismic and Drilling Protocols are sub-divided into the following sections and numerical series:

100 Environmental Planning

200 General Operating Procedures

300 Spill Prevention and Emergency Response

- 310 Spill Prevention
- 320 Oil Spill Response
- 330 H2S Planning and Response

400 Waste Management

500 Abandonment and Reclamation

Irrelevant field Protocols, i.e., pertaining to series 200 and 500, for a particular exploration program can be deleted from the spreadsheet prior to conducting the field audit.

- **Production Audit** -- addresses production facilities such as batteries, compressor stations, sweet and sour gas plants, in-situ plants, straddle plants and pipeline distribution systems. The order of Protocols follows the facility process flow, where possible: from where raw resources enter the facility to product storage or departure.

The Production Audit questions are sub-divided into the following sections and numerical series:

100 Environmental Planning and Management

- 110 Personnel
- 120 Procedures and Recording
- 130 Compliance
- 140 Monitoring

200 General Operating Procedures

- 210 Wellsites and Flowlines
- 220 Storage and Loading
- 230 Aesthetics
- 240 Water Supply

300 Spill Prevention and Emergency Response

- 310 Spill Prevention
- 320 Oil Spill Response
- 330 H2S Planning and Response

400 Waste Management

- 410 Operating Procedures
- 420 Dangerous Goods
- 430 Liquid Wastes
- 440 Solid Wastes

500 Abandonment and Reclamation

Irrelevant field Protocols, i.e., pertaining to series 200 and 500, for a particular production facility can be deleted from the spreadsheet prior to conducting the field audit.

Details on Conducting the Audit

- Modifying the Protocols & Procuring a Hard Copy

Whether the team chooses to use a PC or not, the mechanics of modifying the protocols are the same. Without a PC, the team cuts and pastes a hard copy to add and delete questions, before photocopying their final hard copy version.

With a PC, the spreadsheet information, categorized as codes, protocols, auditor aids, scores and scoring guides, are added and deleted with the use of the keyboard. Columns and rows of information can be readily manipulated, before the final hard copy is printed. These audit spreadsheets terms are defined below:

CODE - Each Protocol (question) is specified by an alpha-numeric code so information can be retrieved by facility or audit topic.

Consider the seismic audit guidelines, coded "SEIS:. The numerical system assists in identifying the audit topics by incremental 100 series coding, i.e. SEIS 100 for Environmental Planning, SEIS 200 for General Operating Procedures, SEIS 300 for Spill Prevention and Emergency Response, SEIS 400 for Waste Management and SEIS 500 for Abandonment and Reclamation. The Protocol number sequences in each series, such as 101,102,103 and 104 provides the sequence for asking questions and reference identification.

PROTOCOL - The protocols are questions with "yes" or "no" answers designed to minimize ambiguity. An attempt was made to phrase each question in layman language.

SCORE - The auditor, after reviewing the auditor aid and scoring guide, assigns a score relative to the instructions or his/her professional judgement. Scoring is subjective and may be adjusted by individual users to suit their specific priorities and objectives.

AUDITOR AID - The auditor aid provides guidelines for the auditor in answering the Protocol and assigning a score in an objective and consistent manner. Information sources in the Environmental Operating Guidelines (EOG) are identified in the Auditor Aid to provide further assistance to the auditor, if required. In some instances, "professional judgement" of the auditor is required when no specific reference information is available. "Professional judgement" refers to the auditor's experience and knowledge required to identify an answer and provide a score.

SCORING GUIDE - The scoring guide anticipates a range of observations that are made in response to a specific protocol. The auditor aid may contain information about suggested or approved practices. The scoring guide is weighted to award maximum points for observed compliance with the practices outlined in the aid. Professional judgement must be exercised when awarding partial points for attempted compliance.

The following example is illustrative of these considerations:

Protocol	Auditor Aid	Scoring Guide
DRLL 312	Dykes should have impermeable sides and bases. There should be no open drains. EOG 3.3.8	5 - impermeable dykes 1-3 - dyke with drain 0 - no dykes

Choosing Protocols

All protocols with an asterisk (*) should be answered during an initial audit. These Protocols have been selected by the study team as they identify potentially high liability concerns when environmental performance or regulatory compliance is nonexistent or unacceptable. The Audit Team should select and/or modify as many additional Protocols as required to meet the Audit objectives

Answering the Protocols

Once the hard copy is printed, the audit team can begin the audit in-house first with documentation and verification.

Next, the audit team needs to meet with field personnel and interview key employees, review on-site records, and so forth.

Some answers will not be found immediately. For example, consider the results from wastes samples that need to be analyzed first.

Scoring the Protocols

If the audit scores are entered onto the computerized spreadsheet, they will be automatically calculated and summarized. If hard copies are used, manual calculation will be required.

The computerized spreadsheet format provides the capability to add the scores, and calculate percentages, totals, statistical analysis, and graphics, if so desired. Most spreadsheet applications for personal computers have some database (sorting) functions, which could be utilized for comparing audit data year to year, and by facility type, location, for relative performance.

Converting scores to a percentage determines compliance/performance ratings.

A percentage for each section within the audit (i.e., series 100, 200, 300, etc.) and overall (management, exploration, production) is calculated:

$$\frac{\text{score points (given by auditor)}}{\text{maximum \# points for each protocol}} = \text{\% of max possible score}$$

For example, if the total available score from questions asked is 100 and the auditor scored the responses at 60, the facility would be given a 60% performance/liability rating. This facility has a lower environmental performance rating and potential higher liability than a facility scoring 80%.

This performance rating can be used to evaluate environmental performance of a single facility over time, or between similar facilities. The Audit Team should strive for consistency, as the scoring and tabulation is subject to a degree of professional judgement.

Summarizing the Audit Scores

A maximum of three reporting categories for summarizing the ratio of actual audit score: possible maximum score is suggested. These categories reflect the range of the audit scores possible for any given Protocol (5 points, 3 points and 0 points). The scoring system and compliance/liability categories can be modified as desired by users once they are familiar with the system.

C1	Superior level of environmental compliance/performance, score is 80-90% of possible maximum score.
C2	Acceptable level of environmental compliance/performance, score is 60-80% of possible maximum score.
C3	Unacceptable level of environmental compliance/performance, score is less than 60% of possible maximum score.

STEP 5: Evaluating the Audit

After an exploration activity or production facility has been audited, the audit team must evaluate the results and identify areas and activities of high environmental performance, as well as areas of concern and environmental liability.

Company facilities or operating procedures that are contrary to existing and anticipated environmental regulations and permit conditions should be brought to the attention of the appropriate line managers. Corrective measures should be specified in an order of priority. A time period should be designated for completion of the mitigative action.

STEP 6. Audit Reporting

It is suggested that an audit report be prepared to answer the following:

- Why the audit was conducted? Who decided to audit and when? What were the objectives of the auditing program?
- Who the audit team members and support were? Why they were selected and the experience they brought to the team?
- What facilities were audited and why?
- When the audit was conducted?
- How the audit was conducted? (Include what pre-audit data was gathered, how and why.)
- What were the goals and priorities of the audit team?
- What the results of the audit were? (Include Protocols) The scoring information can be summarized in tabular format (example overleaf) and results and recommendations presented in a written report.
- How does this audit compare to previous audits or other sites?
- What recommendations did the audit team have?
- What mitigative actions are required, and within what time period should the corrective measures be completed?
- When should the next audit take place?

ENVIRONMENTAL AUDIT SCORE-SHEET

SECTION	Audit Score			Total Score	
	score	possible score	%	possible score	%
MANAGEMENT				100	
Policy & Procedures		35			
Programs		40			
Organization		15			
Personnel		10			
SEISMIC				225	
Environmental Planning		65			
General Operating Procedures		35			
Spill Prevention & Emergency Response		55			
Waste Mangement		25			
Abandonment & Reclamation		45			
DRILLING				315	
Environmental Planning		30			
General Operating Procedures		25			
Spill Prevention & Emergency Response		105			
Waste Mangement		105			
Abandonment & Reclamation		50			
PRODUCTION				890	
Environmental Planning		145			
General Operating Procedures		440			
Spill Prevention & Emergency Response		105			
Waste Mangement		160			
Abandonment & Reclamation		40			
TOTAL SCORE		1530			

STEP 7: Audit Follow-up

Production facilities and exploration programs with high levels of environmental performance should be recognized by senior Corporate personnel. Management could consider implementing an Environmental Awards system as a part of the overall Audit program.

Remedial actions that are required should be given priority ratings and deadlines for completion. Information about corrective measures recommended and corrective measures implemented should be recorded in the baseline data prior to the next audit.

The scheduling of subsequent audits should be considered at this time.

STEP 8: Auditing the Audit

A review of the audit process should assess audit protocol selection and scoring, audit scheduling, and audit logistics. Relevant questions include:

- Did the audit perform its intended purpose?
- Was the audit team correctly selected to meet the goals of the audit?
- Was there sufficient cooperation from on-site personnel?
- Which, if any, auditing procedures or practices require modification?
- Were information gathering mechanisms satisfactory?
- Which procedures developed and refined as a result of this audit are applicable to other sites?
- What went particularly well during this audit?
- What did not go particularly well during this audit?

Auditing the audit may involve company personnel not involved directly with the audit can assess the program or the facility personnel can assess it by completing a questionnaire. Also outside consultants can be used to assess the audit process and its findings.

4.0 Computer Guide for the Environmental Audit Guidelines

Using a Personal Computer

The CPA Environmental Auditing Guidelines were developed on a spreadsheet program (Microsoft Excel V1.04). This program is available for DOS and Apple MacIntosh personal computers. Data from Excel can be read into other programs such as Lotus 1-2-3 and similar products.

Preparing an Environmental Audit for a Specific Exploration Activity or Production Facility

Master copies of Management, and Exploration or Production directories should be first duplicated. The duplicate copies can be 'saved' using a new name or code which can identify the exploration activity or production facility, and the date of the audit. An example would be, EnvAud, Big Stone Gas Plant 03/01/89.

After the master copies have been duplicated and renamed, the component spreadsheets of Management Directory should be opened and the "Protocols" modified to suit Corporate requirements.

If a sweet gas plant is to be audited, the spreadsheets in the renamed Production Directory should be 'opened' and the "Protocols" modified to suit that particular facility. For example, it may be possible to 'delete' all Protocols relating to sour gas, if the plant processes sweet gas only.

What questions are important to ask during an audit and what should an auditor inexperienced with the audit program or facility concentrate on?

Protocols with an asterisk (*) should be answered during an initial audit. These Protocols have been selected by the study team as they identify potentially high liability concerns when environmental performance or regulatory compliance is non-existent or unacceptable.

Protocols are removed by 'highlighting' or 'selecting' and deleting horizontal rows of the spread sheet.

Text in each 'cell' of the spreadsheet can be modified by 'selecting' the cell and using the programs text editing functions.

The scoring system can be easily modified by 'selecting' the scoring 'cell' and using the program's arithmetic and automatic calculation functions can be modified to suit company requirements.

Scoring summaries can be automatically read into a summary sheet such as the example shown by using the spreadsheet programs 'scripting' functions as shown in Step 6.

SECTION 3
ENVIRONMENTAL AUDIT PROTOCOLS

MGMT100 Pol&Proc-Code&Date

MGMT	100	Policy and Procedures - Protocol	Score
MGMT	101	Is there a company policy that addresses the CPA Code of Practice?	☐
MGMT	* 102	Do the company's written policies, standards, procedures and programs show evidence that environmental concerns have been consistently addressed throughout the company?	☐
MGMT	* 103	Do the company's written policies, standards, procedures and programs show evidence that environmental concerns have been consistanly applied since their inception?	☐
MGMT	* 104	Do the company's written policies, standards, procedures and programs show evidence that environmental concerns such as compliance with statutary regulations and industry guidelines are a primary objective?	☐
MGMT	* 105	Does the company investigate all proposed property purchases for potential environmental liabilities?	☐
MGMT	* 106	Does the company ensure that all lands/properties tendered for sale are free from environmental liabilities?	☐
MGMT	* 107	Does the company currently undertake audits of co-venture and joint venture operations?	☐

Total Policy & Procedures score ☐

MGMT100 Pol&Proc-Code&Date

MGMT	100	Policy and Procedures - Auditor Aid	Scoring Guide
MGMT	101	Refer to the CPA Code of Practice and rate the written company committments against it.	5 - policy in place 1-3 - partial 0 - no policy
MGMT	102	Rate existing written company policy and procedure guidelines to identify the company position on environmental concerns.	5 - clear evidence 1-3 - partial 0 - no evidence
MGMT	103	Meet with department managers and review department policies and daily procedures in dealing with environmental issues.	5 - clear evidence 1-3 - partial 0 - no evidence
MGMT	104	Rate existing written company policy and procedure by identifying the company position on environmental regulations and general corporate community practices.	5 - clear evidence 1-3 - partial 0 - no evidence
MGMT	105	Abandoned or producing properties may have experienced spills or other discharges that could result in environmental problems. A review of operating history and/or a field investigation may prevent costly liabilities and litigation.	5 - investigated 1-3 - partial 0 - not investigated
MGMT	106	There is precedent and case law that supports the claims of purchasers, against the vendor for clean-up and other related costs who have subsequently discovered that the acquired property has environmental problems. A survey of tendered properties by a qualified third party may reduce these costs and prevent spurious or fraudulent claims.	5 - free from liabilities 1-3 - partial 0 - not checked
MGMT	107	The cost of mitigation/remediation of environmental problems will be passed onto partners, therefore, any efforts to reduce liabilities makes good business sense. Further, under new legislation, if the company has the Directors on the board of a co-venture, the Director may be exposed to personal penalties under the criminal code.	5 - audits performed 1-3 - partial 0 - no audits performed
		Maximum Policy & Procedures score	35

MGMT200 Prog-Code&Date

MGMT	200	Programs - Protocol	Score
MGMT	201	Do company organization strategies and programs contribute to environmental awareness and excellence among employees and contractors?	
MGMT	202	Does the company support activities which create better employee understanding of the company's/industry's needs, problems and accomplishments?	
MGMT	203	Does the company support or conduct programs to make the public aware of industry or company initiatives for the prevention and control of environmental hazards?	
MGMT	204	Does the company support or conduct research programs directed at mitigating environmental problems?	
MGMT	205	Does the company have a data management system for recording and retrieving environmental related information?	
MGMT	206	Is there evidence that data is consistently collected and entered into the environmental data management system?	
MGMT	• 207	Have previous audits been conducted at regular intervals and in a consistent manner?	
MGMT	• 208	Have recommendations from previous audits been assessed and/or implemented?	
		Total Programs score	

MGMT200 Prog-Code&Date

MGMT	200	Programs - Auditor Aid	Scoring Guide
MGMT	201	Some companies are developing environmental award programs similar to the safety award program to encourage personnel to work with environmental issues.	5 - strong contribution 1-3 - partial 0 - no contribution
MGMT	202	Determine if the company participates in industry initiatives (in house; excluding outside advertising) to educate government and the public.	5 - strong support 1-3 - partial support 0 - no support
MGMT	203	Look for corporate or field level programs that are aimed at the general public or at site specific populations to promote company initiatives.	5 - strong support 1-3 - partial support 0 - no support
MGMT	204	Look for participation in large or small programs directed toward understanding and solving environmental concerns.	5 - strong support 1-3 - partial support 0 - no support
MGMT	205	Whether manual or computerized, the system must access large amounts of data, and must be easily updated.	5 - system in place 1-3 - partial 0 - no system
MGMT	206	Look for regular and recent entries.	5 - consistency apparent 1-3 - partial 0 - no consistency
MGMT	207	Verify audit frequency. Compare audit reports for consistency of material, and for audit method.	5 - regular & consistent 1-3 - partial 0 - irregular or none
MGMT	208	Check previous audits for recommendations, verify implementation through interview or file inspection.	5 - implemented 1-3 - partial 0 - not implemented

Maximum Programs score 40

MGMT 300 Organization - Protocol		Score
MGMT * 301	Are environmental issues addressed within the company by trained support employees or contract personnel?	☐
MGMT 302	Is there a group or individual responsible for environmental regulatory compliance?	☐
MGMT 303	Do company organization strategies and procedures foster good communications between the company, the public, and government regulatory agencies?	☐
	Total Organization score	☐

MGMT 300 Organization - Auditor Aid			**Scoring Guide**
MGMT	301	Implies techinical skills and experience in the environmental sciences.	5 - trained personnel 1-3 - partial 0 - untrained personnel
MGMT	302	Identify group and/or individuals.	5 - responsibilty known 1-3 - partial 0 - not indentified
MGMT	303	Review with department managers responsible for various field operations and determine if good communication exists with government and the public. Check available records for complaints by government or public.	5 - open and frequent communication 1-3 - partial 0 - no communication
		Maximum Organization score	15

MGMT	**400**	**Personnel - Protocol**	**Score**
MGMT	401	Are environmental responsibilities/accountabilities detailed for: Senior Management? Operations Management? Senior Operating personnel? Environmental Coordinators/advisers?	
MGMT	402	Do employee appraisals include consideration of the company's environmental performance relative to the respective employee responsibilities?	

Total Personnel score

MGMT	**400**	**Personnel - Auditor Aid**	**Scoring Guide**
MGMT	401	Based on existing environmental regulations and constant regulation changes certain employees are being given the responsiblity of staying current with environmental regulations to prevent the company from liability or shut down as a result of an environmental related incident. Identify if management recognises the concern and interview personnel to determine if these responsiblities and accountabilies are part of their job description.	5 - responsiblities assigned 1-3 - partial 0 - not indentified
MGMT	402	Employees may have responsibilities which include environment related regulatory authorizations, transporting dangerous goods, hazardous waste management, reclamation duties or vegetation management.	5 - set criteria 1-3 - partial 0 - not indentified

Maximum Personnel score 10

SEIS100 EnvPlan-Code&Date

SEIS	**100**	**Environmental Planning - Protocol**	**Score**
SEIS	101	Prior to field operations, were all environmental regulatory authorizations completed and approved?	
SEIS	* 102	Were all environmental regulatory authorization terms and conditions reviewed by the project supervisor with the contractors and their personnel?	
SEIS	* 103	Were copies of all regulatory authorizations available on-site for review and guidance purposes?	
SEIS	104	Did the Seismic Party Chief or other designated representatives, notify the responsible government, land owners/occupants prior to the commencement of seismic operations?	
SEIS	* 105	Were environmental concerns taken into consideration when planning alignment of access roads and survey lines?	
SEIS	106	Was consideration given to minimizing disturbances through the use of existing trails and road allowances?	
SEIS	* 107	Was on-site planning and supervision implemented prior to beginning seismic work in environmentally sensitive areas?	

SEIS 100	**Environmental Planning - Auditor Aid**	**Scoring Guide**
SEIS 101	For an exploration program, an exploration license, permit, and letter of authority (approval) is required. If any waterbodies or watercourses are affected, a permit may be required. EOG 3.1, 3.2	5 - all approved 1 - 3 - partially 0 - none approved
SEIS 102	To ensure the implementation of environmental protection measures, the contractor must be aware of and act on environmental concerns and restrictions.	5 - guidelines reviewed 1 - 3 - partially 0 - not reviewed
SEIS 103	Regulations require that copies of all licenses and permits to be on-site and visible. Were personnel aware of permit/licence requirements?	5 - copies on-site 1 - 3 - patially 0 - no copies on-site
SEIS 104	Check if pre-program contacts were completed with involved government representatives and land owners/occupants, and if any new concerns or problems were identified. EOG 3.2	5 - notification given 1 - 3 - patially 0 - no notification
SEIS 105	Environmental concerns include loss of timber, forage and crops, wildlife harassment, and water pollution. Inspect the line for these concerns. EOG 3.3.1, 3.3.2, 3.3.5, 3.3.7, 8.1	5 - concerns considered 1 - 3 - partially 0 - not consisdered
SEIS 106	Alberta Energy and Natural Resources requests that during the planning stage, minimal disturbance to the environment be taken into consideration. Check if the permit conditions include certain restrictions. EOG 3.3.9	5 - minimized 1 - 3 - partially 0 - not considered
SEIS 107	To minimize the possibility of a problem occuring qualified personnel should provide supervision within environmentally sensitive areas. Identify if supervision was undertaken.	5 - implemented 1 - 3 - patially 0 - no implementation

SEIS	**100**	**Environmental Planning - Protocol**	**Score**
SEIS	* 108	Was a procedure in place which required the monitoring and recording of those seismic operations which resulted in disturbances to the environment?	☐
SEIS	109	In environmentally sensitive areas, were procedures undertaken to restrict public access?	☐
SEIS	110	Were seismic shot points and shot lines routed a minimum of 180 meters away from farm buildings and water wells?	☐
SEIS	111	Did line planning restrict seismic activity to a minimum of 45 meters from any water body?	☐
SEIS	* 112	Have all potential pollutants been identified, and acceptable handling procedures developed and implemented?	☐
SEIS	113	Have all water wells and surface water sources been identified and was a water testing program conducted?	☐

Total Environmental Planning Score ☐

SEIS 100	Environmental Planning - Auditor Aid	Scoring Guide
SEIS 108	Review any operations documentation that includes recording work within environmental constraint areas which provides potential due-diligence information.	5 - policy in place 1 - 3 - patially 0 - no policy
SEIS 109	Regulations require a restriction to public access by the use of gates and signs. Determine if gates and signs were adequate. EOG 8.1.1	5 - access restricted 1 - 3 - partially 0 - unrestricted access
SEIS 110	Regulations require a distance restriction of 180 meters. Determine if these restrictions were enforced.	5 - restrictions applied 1 - 3 - partially 0 - unrestricted lines
SEIS 111	Permit regulations restrict seismic activity adjacent to a water body. Identify if permit restrictions exist and inspect restricted areas. EOG 3.3.6, 8.2	5 - restrictions applied 1 - 3 - partially 0 - no restrictions
SEIS 112	Regulatory guidelines require the control of all pollutant material and acceptable handling procedures.	5 - implemented 1 - 3 - patially 0 - no implementation
SEIS 113	If a water source is within 180 meters of a line, the source should be identified. To protect the company from liability, water yield and quality should be recorded prior to seismic activity.	5 - indentified & tested 1 - 3 - patially 0 - no identification

Maximum Environmental Planning score 65

SEIS200 GenOpProc-Code&Date

SEIS	200	General Operating Procedures - Protocol	Score
SEIS	201	Were gates constructed at all private fence crossings prior to field operations? Were these gates removed and the fences properly restored after all work was completed?	
SEIS	202	When clearing a line, were proper precautions taken to mitigate damage to ground cover within and outside the right-of-way?	
SEIS	* 203	Were environmental protection measures implemented for stream crossings?	
SEIS	204	In forested areas was timber felled onto the line and properly removed? Was slash such as tree tops, limbs and stumps disposed of as per government, land owner, or land occupant requests?	
SEIS	205	Were vehicle operations restricted to prevent vegetation damage, soil compaction and erosion?	
SEIS	* 206	Were shot holes plugged to prevent water seepage and/or damage to livestock and wildlife?	
SEIS	* 207	Within the program, was the handling of explosive material acceptable; more specifically within sensitive environmental areas such as those adjacent to water bodies, springs or wells and wildlife habitat?	

Total General Operating Procedures score ☐

SEIS 200	General Operating Procedures - Auditor Aid	Scoring Guide
SEIS 201	Regulatory guidelines require public access control. Land owners and occupants may request livestock control. Determine what work was undertaken. EOG 3.3.1	5 - fencing completed 1 - 3 - partially 0 - no gates or fencing
SEIS 202	Forest and Prairie Protection Regulations and AENR Regulations provide guidelines for conditions to the permit process which restrict clearing operations. Identify if clearing operations were restricted. EOG 3.3.5	5 - precautions taken 1 - 3 - partially 0 - no precautions taken
SEIS 203	An inspection should be conducted at all stream crossings to determine if sediment or stream bank problems exist. EOG 3.3.6, 8.2	5 - implemented 1 - 3 - partially 0 - not implemented
SEIS 204	Identify if all salvageable timber was recovered, and that slash disposal meets the approval of involved government, landowner or occupant representatives. Determine if the slash was strategically placed for erosion control. EOG 3.3.2, 3.3.3, 8.4	5 - procedures followed 1 - 3 - partially 0 - unapproved methods
SEIS 205	Improper use of vehicles, and working during unfavorable weather conditions should be identified to document resulting soil problems and contractor liability. EOG 3.3.5, 8.4	5 - restrictions applied 1 - 3 - partially 0 - no restrictions
SEIS 206	Regulatory guidelines require that cratered holes must be plugged and filled in to prevent water problems. EOG 3.3.9	5 - holes plugged 1 - 3 - partially 0 - holes left open
SEIS 207	Regulatory guidelines require strict handling of explosives. The use of explosives within environmentally sensitive areas is not permitted. An inspection should be conducted within these areas to determine if explosives were used. EOG 3.3.9	5 - acceptable 1 - 3 - partially 0 - unacceptable
	Maximum General Operating Procedures score	35

SEIS 300 Spill Prevention and Emergency Response

SEIS	310	Spill Prevention - Protocol	Score
SEIS	311	Was fuel stored in welded tanks, bolted tanks or bladders?	
SEIS	312	Were all fuel tanks located within an impermeable dyke of adequate size to meet or exceed regulatory requirements?	
SEIS	313	Were fueling and fuel transfer operations conducted without spillage?	
SEIS	314	Were all fuel storage and handling operations located at least 100 meters from the nearest water body?	
SEIS	* 315	Was a reporting process in place documenting accidental spills and recording contact with involved company, government, and land users?	
		Total Spill Prevention score	

SEIS 300 Spill Prevention and Emergency Response

SEIS 310 Spill Prevention - Auditor Aid

			Scoring Guide
SEIS	311	Bladders should be avoided. Bolted tanks are marginally acceptable. Welded tanks are most preferred. EOG 3.3.8	5 - welded tanks 1-3 - bolted tanks 0 -bladders
SEIS	312	Dykes should have impermeable sides and bases. There should be no open drains. EOG 3.3.8	5 - impermeable dykes 1-3 - dyke with drain 0 - no dykes
SEIS	313	Look for evidence of soil or water contamination due to poor preventative precautions. EOG 3.3.8	5 - no spillage 1-3 - some spillage 0 - spillage evident
SEIS	314	Even properly bermed and stored products should not be located closer than 100 meters from surface waters.	5 - > 100 m 1-3 - close to 100 m 0 - < 100 m.
SEIS	315	Verify existence of documentation process, check if utilized.	5 - process in place 1-3 - partial 0 - no report process

Maximum Spill Prevention score 25

SEIS300 SP&ER-Code&Date

SEIS	320	Spill Response - Protocol	Score
SEIS	* 321	Is there a spill contingency plan for the seismic operation?	☐
SEIS	322	Is a copy of the spill plan available on-site, and are personnel familiar with the plan and procedures? Has the plan been rehearsed?	☐
SEIS	323	Does the company belong to mutual aid organizations to support in-house response efforts?	☐
SEIS	* 324	Do company personnel or contractors participate in training or drills to improve the response efficiency of company and mutual aid organizations?	☐
SEIS	325	Were all spills properly cleaned up, and the necessary reclamation procedures implemented?	☐
SEIS	* 326	Is there adequate spill response clean-up equipment on-site?	☐

Total Spill Response score ☐

Total Spill Prevention and Emergency Response score ☐

SEIS300 SP&ER-Code&Date

SEIS	320	Spill Response - Auditor Aid	Scoring Guide
SEIS	321	Locate copy and determine if it is specific/appropriate for the operation.	5 - plan 1-3 - partial 0 - no plan
SEIS	322	Locate copy, and through interview determine the level of knowledge and ability to successfully implement.	5 - copy on site 1-3 - partially familiar 0 - no copy on-site
SEIS	323	Specifically oil spill cooperatives or qualified contractors/consultants on location.	5 - active member 1-3 - inacitve member 0 - not a member
SEIS	324	Verify through interview of company or cooperative personnel.	5 - active participation 1-3 - partial 0 - no participaton
SEIS	325	Review spill area records and inspect site.	5 - proper clean-up 1-3 - partial 0 - no clean-up
SEIS	326	Verify through inspection. Rate according to amount and adequacy of equipment.	5 - adequate equipment 1-3 - some equipment 0 - no equipment

Maximum Spill Response score	30
Maximum Spill Prevention and Emergency Response score	55

SEIS	400	Waste Management - Protocol	Score
SEIS	401	Were measure taken to prevent public, wildlife or livestock access to temporary waste storage sites?	
SEIS	402	Was all garbage on the line picked up, burned, and/or buried at a government or land owner approved disposal area?	
SEIS	* 403	Were identified toxic or hazardous wastes transported out of the seismic line area and disposed of at an approved disposal site? Were all transport and disposal approvals received in writing prior to the removal of this material?	
SEIS	404	Was sewage from campsite operations disposed of by acceptable subsurface tile drainage or deep pit burial?	
SEIS	405	Were government procedures followed in the completion of campsite solid waste incineration and methods of disposal?	

Total Waste Management score ☐

SEIS400 WasteMgmt-Code&Date

SEIS 400	Waste Management - Auditor Aid	Scoring Guide
SEIS 401	Review records, interview personnel, inspect sites.	5 - restricted access 1-3 - partial 0 - unrestricted access
SEIS 402	Regulation guidelines require government approval prior to disposal operations. Review acceptable procedures with the seismic supervisor, and inspect the disposal locations. EOG 3.3.11; 8.7.5	5 - proper disposal 1-3 - partial 0 - no disposal
SEIS 403	Hazardous waste handling and disposal must comply with government regulations. Identify acceptable procedures with involved personnel, and followup with an inspection of the storage and disposal areas. EOG 3.3.11; 8.7.4; 8.7.5	5 - proper disposal 1-3 - partial 0 - no approved disposal
SEIS 404	A septic field method of sewage disposal for a campsite is the preferred method of disposal. Inspect the storage and camp areas for disposal methods. EOG 3.3.11; 8.6.3	5 - proper disposal 1-3 - partial 0 - no approved disposal
SEIS 405	Garbage can be burned daily on site or removed to an acceptable landfill site. Inspect the disposal area and determine if contamination occurred. EOG 3.3.11; 8.7.5	5 - proper disposal 1-3 - partial 0 - no approved disposal
	Maximum Waste Management score	25

SEIS500 Abd&Rec-Code&Date

SEIS	500	Abandonment and Reclamation - Protocol	Score
SEIS	* 501	Is there a revegetation program available for this operation?	
SEIS	502	Were line cleanup operations completed in an acceptable manner and slash debris adequately spread?	
SEIS	503	Was topsoil and subsoil material adequately restored on the line to prevent soil erosion?	
SEIS	504	Were berms and cross dykes constructed across graded slopes to prevent soil erosion?	
SEIS	505	Was debris successfully removed from stream crossings and the stream bank. Was a stabilizing buffer used to prevent soil erosion and damage to fish habitat?	
SEIS	506	Was the line adequately prepared for a revegetation program?	
SEIS	507	Were the seed varieties used for revegetation compatible with existing land uses and acceptable to the government and the land owner?	
SEIS	508	Were the methods of reseeding and erosion control acceptable to the seismic exploration permits and approvals?	
SEIS	* 509	Did all off line areas which were disturbed by seismic operations receive land reclamation work?	

Total Abandonment & Reclamation score

SEIS500 Abd&Rec-Code&Date

SEIS	**500**	**Abandonment and Reclamation - Auditor Aid**	**Scoring Guide**
SEIS	501	Revegetation is required to complete the reclamation. Look for written documentation.	5 - program documented 1-3 - partial 0 - no program
SEIS	502	Cleanup operations should follow company guidelines and comply with government and landowner requirements. Inspect cleanup on the line. EOG 3.3.5; 3.3.12; 8.5	5 - acceptable clean-up 1-3 - partial 0 - unaccetable
SEIS	503	Regulatory guidelines require topsoil conservation. Inspect line and determine if problems exist. EOG 3.3.5; 3.3.12; 8.5	5 - soil restoration 1-3 - partial 0 - poor restoration
SEIS	504	Control of erosion and potential pollution in the Green area is regulated. Identify erosion control areas with the seismic supervisor and inspect for concerns. EOG 8.5	5 - dykes constructed 1-3 - partial 0 - no dykes
SEIS	505	Regulatory guidelines require strict control of soil disturbances within and adjacent to stream crossings. Identify if soil disturbances are a concern. EOG 3.3.6; 8.2	5 - control implemented 1-3 - some controls 0 - no controls
SEIS	506	Successful revegetation of the line in part depends on seed bed preparation. Inspect for adequate soil conditions. EOG 3.3.5; 3.3.12; 8.4.2	5 - adequate preparation 1-3 - partial 0 - no preparation
SEIS	507	Re-vegetation is required to reach a productivity at least comparable to its undisturbed condition. Inspect during vegetation establishment. EOG 8.4.2	5 - acceptable vegetation 1-3 - partial 0 - no vegetation
SEIS	508	Reclamation of the land is to be consistent with the original site, including land forms, hydrology, and slope. Inspect the line to determine what work has been done. EOG 8.4.2	5 - acceptable methods 1-3 - partial 0 - unacceptable method
SEIS	509	In coordination with the seismic supervisor, inspect all off line areas to identify if required work has been done.	5 - reclamation done 1-3 - partial 0 - no reclamation

Maximum Abandonment & Reclamation score 45

DRLL100 EnvPlan-Code&Date

DRLL	**100**	**Environmental Planning - Protocol**	**Score**
DRLL	* 101	Prior to field operations, were all environmental regulatory authorization requirements completed and approved?	
DRLL	* 102	Were all environmental regulatory authorization conditions reviewed by the project supervisor with the contractors and their personnel?	
DRLL	* 103	Were copies of all regulatory authorizations kept at the wellsite for review and guidence purposes?	
DRLL	104	Did company personnel notify responsible government representatives, land owner and land occupant(s) prior to the commencement of drilling operations?	
DRLL	* 105	Were environmental concerns taken into consideration when planning the construction of the wellsite, access roads, sumps (remote and on-site), and camp facilities?	
DRLL	106	In environmentally sensitive areas, were procedures implemented to restrict public access?	
		Total Environmental Planning score	

DRLL 100	**Environmental Planning - Auditor Aid**	**Scoring Guide**
DRLL 101	For an exploration program an exploration license, permit, and letter of authority (approval) is required. Check if these were at the wellsite. If any water body or watercourse is affected a permit may be required. EOG 4-3.1	5 - all completed 1-3 - partially 0 - not completed
DRLL 102	To ensure the success of a drilling program and reduce the environmental impacts identify if the contractor is aware of environmental concerns and restrictions.	5 - all reviewed 1-3 - partially 0 - none reviewed
DRLL 103	Regulations require that copies of all authorizations be on-site and available.	5 - all available 1-3 - partially 0 - none available
DRLL 104	Identify if notifications were documented. Identify any concerns. EOG 4.2; 4.3	5 - all notified 1-3 - partially 0 - none notified
DRLL 105	Consider surface runoff, proximity to streams, residences, roadways and access for heavy vehicles. Look for evidence of slumping, ponding, or exposed ice-rich materials. Look for design considerations in sump and wellsite construction. EOG 4-3.1, 8.1; 8.6	5 - all considered 1-3 - partially 0 - not considered
DRLL 106	Regulations may require restrictions to public access by the use of gates and signs. Where required, determine if gates and signs were adequate. EOG 8.1	5 - all implemented 1-3 - partially 0 - not implemented
	Maximum Environmental Planning score	30

DRLL	**200**	**General Operating Procedures - Protocol**	**Score**
DRLL	201	Were all environmental regulatory authorizations posted by the drilling supervisor on-site?	
DRLL	202	Were the flare pits properly constructed and operated?	
DRLL	203	Prior to flaring gas containing more than 1% H2S, was the necessary written approval obtained?	
DRLL	* 204	Were all chemicals properly stored during the drilling program?	
DRLL	* 205	Were drilling fluids, produced liquids, and frac fluids separated, contained, and disposed of as per regulatory requirements?	
		Total General Operating Procedures score	

DRLL200 GenProc-Code&Date

DRLL	**200**	**General Operating Procedure - Auditor Aid**	**Scoring Guide**
DRLL	201	Verify by inspection.	5 - all posted 1-3 - partially 0 - not posted
DRLL	202	Check for sufficient freeboard, location re winds, drainage control, resident notification, spray minimization. EOG 4.3.10	5 - all acceptable 1-3 - partially 0 - not acceptable
DRLL	203	Check for copy of written approval. EOG 4.3.10	5 - all completed 1-3 - partially 0 - not completed
DRLL	204	Verify by inspection.	5 - acceptable 1-3 - partially 0 - not acceptable
DRLL	205	Review drilling licence, lease documentation, and drilling program for fluid handling requirements. EOG 4.3.10	5 - all acceptable 1-3 - partially 0 - not acceptable
		Maximum General Operating Procedures score	25

DRLL 300 Spill Prevention and Emergency Response

DRLL 310 Spill Prevention - Protocol

			Score
DRLL	311	Was fuel stored in welded tanks, bolted tanks or bladders?	
DRLL	312	Were all fuel tanks located within an impermeable dyke. Was the volume within the dyked areas sufficient to hold all the fuel?	
DRLL	313	Were fueling and fuel transfer operations conducted without spillage?	
DRLL	314	Were all fuel storage and handling operations located at least 100 meters from the nearest water body?	
DRLL	315	Was there evidence of fuel spilled outside containment areas?	
DRLL	* 316	Is a reporting process in place to document accidental spills and provide contact with involved company and government personnel, and land users?	
DRLL	317	Were all spills properly cleaned up, and the necessary reclamation procedures implemented?	
		Total Spill Prevention score	

DRLL 300 Spill Prevention and Emergency Response

DRLL 310 Spill Prevention - Auditor Aid

			Scoring Guide
DRLL	311	Bladders should be avoided. Bolted tanks are marginally acceptable. Welded tanks are most preferred. EOG 3.3.8	5 - welded tanks 1-3 - bolted tanks 0 - bladders.
DRLL	312	Dykes should have impermeable sides and bases. There should be no open drains. EOG 3.3.8	5 - impermeable dykes 1-3 - dyke with drain 0 - no dykes
DRLL	313	Look for evidence of soil or water contamination due to poor preventative precautions. EOG 3.3.8	5 - no spillage 1-3 - some spillage 0 - spillage evident.
DRLL	314	Even properly bermed and stored products should not be located closer than 100 meters from surface waters.	5 - > 100 m 1-3 - close to 100 m. 0 - < 100 m.
DRLL	315	Look for physical evidence or reports of spills occurring away from fueling/loading operations.	5 - no evidence 1-3 - some evidence 0 - spills occuring
DRLL	316	To reduce liability issues, a spill reporting and documenting process is important. Identify if the need for this type of process exists, and if in place, how successful is it. EOG 3.3.8	5 - process in place 1-3 - partial 0 - no report process
DRLL	317	Inspect sites.	5 - implemented 1-3 - partial clean-up 0 - no clean-up
		Maximum Spill Prevention score	35

DRLL	**320**	**Spill Response - Protocol**	**Score**
DRLL	* 321	Is there an oil spill contingency plan for the drilling operation?	
DRLL	322	Is a copy of the oil spill plan available on-site, and are personnel familiar with the plan and procedures?	
DRLL	323	Does the company belong to mutual aid organizations to support in-house response efforts?	
DRLL	* 324	Do company personnel or contractors participate in training or drills to improve the response efficiency of company and mutual aid organizations?	
DRLL	325	If deficiencies were noted, or recommendations made arising out of an exercise, were they corrected or implemented?	
DRLL	326	Is there a designated spokesperson, trained for emergency response situations, to respond to regulatory agencies, the media and the public?	
DRLL	* 327	Is there adequate spill response clean-up equipment on-site?	
		Total Spill Response score	

DRLL	**320**	**Spill Response Auditor Aid**	**Scoring Guide**
DRLL	321	Locate copy and determine if it is specific/appropriate for the operation. EOG 8.9.3	5 - plan in place. 1-3 - partial plan 0 - no plan
DRLL	322	Locate copy and through interview, determine the level of knowledge and ability to successfully implement. EOG 8.9.3	5 - copy on-site & used 1-3 - on-site copy unused 0 - no on-site copy
DRLL	323	Specifically oil spill cooperatives or qualified contractors/consultants on location. EOG 8.9.3	5 - Active member 1-3 - not on location 0 - not a member
DRLL	324	Verify through interview of company or cooperative personnel.	5 - active participation 1-3 - partialy implemented 0 - no participation
DRLL	325	Verify through interview and/or files that appropriate changes were made. EOG 8.4.3	5 - implemented 1-3 - partial participant 0 - no participation
DRLL	326	Review emergency response plans. Interview appropriate people about training and responsibilities.	5 - implemented 1-3 - partial participant 0 - no participation
DRLL	327	Verify through inspection. Rate according to amount and adequacy of equipment.	5 - adequate equipment 1-3 - some equipment 0 - no equipment on-site

Maximum Spill Response score 35

DRLL	330	H2S Emergency Response - Protocol	Score
DRLL	331	Is on-site H2S detection equipment properly calibrated and operational?	
DRLL	332	Does the emergency response plan describe possible evacuation scenarios as H2S levels increase?	
DRLL	333	Is there a current residents list and contact numbers; have evacuation plans been discussed with residents?	
DRLL	334	Is there a clear statement/criteria regarding the decision to ignite a sour gas well?	
DRLL	335	Has the decision making, for ignition, been delegated to field (on-site) personnel to prevent delays?	
DRLL	* 336	Has (was) a major exercise of the H2S emergency response plan involving field and headquarters personnel been conducted?	
DRLL	* 337	If there were deficiencies noted or recommendations made arising out of an exercise, were they corrected or implemented?	

Total H2S Emergency Response score ☐

Total Spill Prevention and Emergency Response score ☐

DRLL	**330**	**H2S Emergency Response - Auditor Aid**	**Scoring Guide**
DRLL	331	Check location of equipment; verify if operational using H2S source to check calibration.	5 - calibrated & operational 1-3 - partially operational 0 - not operational
DRLL	332	Check documents for activation sequences.	5 - scenarios described 1-3 - partial description 0 - no scenarios described
DRLL	333	Check for document. Verify numbers if possible; verify consultation with residents and ability to contact during an emergency.	5 - current list 1-3 - list not current 0 - no list
DRLL	334	Review emergency response plan and company procedure manuals. Does it comply with regulatory guidelines?	5 - clear statement/criteria 1-3 - uncertain criteria 0 - no criteria
DRLL	335	Review emergency response plan and perhaps job description; verify understanding of designated field person. Determine if there is disagreement.	5 - delegation clear 1-3 - delegation not clear 0 - no delegation
DRLL	336	Determine if exercise occurred; verify that communications were tested and on-site and off-site personnel were exercised. Determine the amount of H2S alert training received by personnel.	5 - excercise conducted 1-3 - partial excercise 0 - no excercise
DRLL	337	Verify through interview and/or files that appropriate changes were made.	5 - implemented 1-3 - partial implemention 0 - no excercise

Maximum H2S Emergency Response score 35

Maximum Spill Prevention and Emergency Response score 105

DRLL 400 Drilling Wastes

DRLL	410	Drilling Fluid Wastes - Protocol	Score
DRLL	411	Were only environmentally safe drilling products used in the program?	
DRLL	412	Were efforts made to conserve or recycle water?	
DRLL	413	Were waste streams segregated before going to the main sump?	
DRLL	414	Were measures taken to protect surface waters, freshwater horizons and mineral resources from contamination?	
DRLL	415	Is there evidence that the main sump has leaked or overflowed?	

DRLL 400 Drilling Wastes

DRLL 410	Drilling Fluid Wastes - Auditor Aid	Scoring Guide
DRLL 411	Check tour sheets against the list of chemicals in EOG. EOG 4.3.5.2	5 - yes 1-3 - partial 0 - unsafe products
DRLL 412	Look for water meters, solids control program, automatic shutoff, segregation of waste streams, and use of low toxicity components. EOG 4.3.5.2	5 - implemented 1-3 - some effort 0 - no effort
DRLL 413	No oily materials, no recovered test fluids, no solid wastes, and no reused chemicals. EOG 4.3.5.1	5 - total segregation 1-3 - some segregation 0 - no segregation.
DRLL 414	Determine if water wells were properly located and cased, surface/production casing set and cemented to surface (or other approved program). Look for control of surface run off and brine. EOG 4.3.8	5 - appropriate measures 1-3 - some measures 0 - no effort
DRLL 415	Look for visual evidence; sump should have freeboard, dyked where necessary, be impervious, and preferably in undisturbed soils. EOG 4.3.5.1	5 - no evidence 1-3 - some leakage 0 - unacceptable

DRLL 410 Drilling Fluid Wastes - Protocol **Score**

DRLL * 416 Waste Drilling Fluid Disposal

(A) Were problems encountered with the disposal of conventional water based drilling muds? ☐

(B) Were appropriate measures taken to deal with KCl fluids and solids, especially those used in salt formations? ☐

(C) Were appropriate procedures used for the disposal of oil based or invert mud systems? ☐

DRLL * 417 Workover and Completion Wastes

(A) Were all workover and completion wastes stored in segregated tanks? ☐

(B) Were salt solutions sent for diposal by:
deep well disposal; approved road spraying; pumping off lease; burial or spread on lease? ☐

(C) Were oil/oil water emulsions disposed by:
salvaging oil; downhole disposal oil reclaimers; pumping off lease; burial or spread on lease? ☐

(D) Were frac sands and compnents buried or spread on the surface of the lease? ☐

(E) Was acid water diposal by:
neutralization/downhole disposal; neutralizing/evaporation; pumping off-lease; burial on-lease; or, directing to sump? ☐

DRLL 410	Drilling Fluid Wastes - Auditor Aid	Scoring Guide
DRLL 416	Waste Drilling Fluid Disposal (A) Acceptable - Burial or surface spreading of solids. Deep injection, surface spreading, or reuse of fluids. Pumping off lease with permission, squeezing, or evaporation (volume dependent). Look for comments from regulatory agencies, property owners, or visual evidence of impairment. Unacceptable - trapping or trenching.	5 - no problems 1-3 - some problems 0 - unacceptable disposal
	(B) Look for evidence of choride washing and/or monitoring. (squeezing, trapping, or trenching of fluid may not be suitable). Look for evidence of segregation of mud used in salt formations, and deep well disposal of fluids. Under certain circumstances surface spreading on roads or lease is acceptable; look for written approval.	5 - appropriate disposal 1-3 - some problems 0 - unacceptable disposal
	(C) Look for segregation of cuttings, and oil collected for reuse. Cuttings can be spread on lease, dried, mixed with fertilizer, and returned to the sump. Fluids from muds used in salt formations can be disposed of by deep well injection. Trenching or trapping of fluids is not acceptable. Look for comments from regulatory agencies.	5 - appropriate disposal 1-3 - some problems 0 - unacceptable disposal
DRLL 417	Workover and Completion Wastes EOG 4.3.5.3 (A) Verify that wastes are not directed to main sump, but separated and contained in properly lined sumps or tanks.	5 - segregrated tanks 1-3 - some segregation 0 - no segregation tanks
	(B) Deep well disposal is preferred; look for copy of approval for road spraying. Others methods of disposal are unacceptable.	5 - deep well disposal 1-3 - appr. road spraying 0 - unacceptable disposal
	(C) Salvaging oil and downhole disposal is preferred; consider looking at hauler and reclaimer operations for potential company liabilities. Others methods of disposal are unacceptable.	5 - down hole disposal 0 - unacceptable disposal
	(D) Any other method is not acceptable.	5 - buried or spread 0 - unacceptable disposal
	(E) Neutralization/downhole disposal is preferred; determine if evaporation leaves residual problem. All other methods of disposal are unacceptable. EOG 4.3.8	5 - down hole disposal 1-3 - evaporation 0 - unacceptable disposal

DRLL	**410**	**Drilling Fluid Wastes - Protocol**	**Score**
DRLL	418	Were there any surface or sub-surface blowouts during the course of the drilling program? If yes: (A) Was the site bermed or otherwise protected to prevent contamination from a surface blowout?	
		(B) Were there proper safeguards in place to prevent contamination of freshwater or mineral horizons?	
DRLL	419	If production quantities of minerals were encountered, during the drilling program, were these zones isolated before the well was suspended or abandoned?	
		Total Fluid Waste score	

DRLL 410	Drilling Fluid Wastes - Auditor Aid	Scoring Guide
DRLL 418	Interview personnel and/or review daily drilling reports.	
	(A) Determine if hydrocarbons or brine has contaminated land or surface waters. Acceptable - no contamination due to containment. Questionable - contamination in spite of containment. Unacceptable - contamination due to no containment.	5 - no contamination 1-3 - some contamination 0 - no safeguards
	(B) Determine if blowout caused communication with a fresh-water horizon and the producing formation. Acceptable performance - no contamination due to safeguards.	5 - safeguards in place 1-3 - some contamination 0 - no safeguards
DRLL 419	Determine if casing has been set or cemented, and open hole plugs placed across the zone(s). EOG 4.3.8	5 - zones isolated 1-3 - some zones isolated 0 - no zones isolated
	Maximum Fluid Waste score	80

DRLL	420	Domestic Campsite Wastes - Protocol	Score
DRLL	421	Was sewage effluent: a) sent to a municipal system; or b) treated on-site?	
DRLL	* 422	When sewage effluent was treated on-site, was the treatment consistent with regulatory and company standards?	
DRLL	* 423	Were all waste oils and toxic wastes disposed of via appropriate practices, or to approved facilities?	
DRLL	424	Was landfilled solid waste properly handled on-site or at off-site dumps?	
DRLL	425	Were solid camp wastes incinerated without problems?	

Total Domestic Campsite Wastes score ☐

Total Waste Management score ☐

DRLL 420	Domestic Campsite Wastes - Auditor Aid	Scoring Guide
DRLL 421	Review records, interview personnel, inspect site. EOG 8.6.3	5 - approved treatment 1-3 - questionable 0 - no treatment
DRLL 422	Package plant, lagoons, septic systems or incineration are potentially suitable systems. Check for effluent quality of plants and lagoons, impermeable liners in lagoons, percolation test of septic field, incinerators and regulatory disposal authorizations. EOG 8.6.3	5 - suitable system 1-3 - partially suitable 0 - unacceptable treatment
DRLL 423	Review records, interview personnel, inspect site. EOG 8.6.3.2	5 - appropriate disposal 0 - unacceptable disposal
DRLL 424	For off-site disposal, was the location an approved municipal landfill. For on-site disposal, was the site properly operated and monitored for leachate? EOG 8.6.4	5 - approved or monitored 1-3 - unmonitored on-site 0 - improper disposal
DRLL 425	Look for the necessary authorizations, smoke problems, disposition of ash residue, and evidence of fire suppression. EOG 8.6.4.3	5 - proper incineration 1-3 - partial compliance 0 - improper incineration
	Maximum Domestic Campsite Wastes score	25
	Maximum Waste Management score	105

DRLL	**500**	**Abandonment and Reclamation - Protocol**	**Score**
DRLL	* 501	Was the necessary well abandonment approval obtained?	
DRLL	* 502	Was the site properly cleaned of trash, wastes, other debris and unseen hazards such as unused chemicals?	
DRLL	* 503	Was debris successfully removed from stream crossings and the stream bank, and was a protective stabilizing buffer used to prevent soil erosion and damage to fish habitat?	
DRLL	504	Were topsoil and subsoil material restored and recontoured to prevent soil erosion?	
DRLL	505	Were berms and cross dykes constructed across all erosion control areas (grade slopes, drainage ways, etc) to prevent soil erosion?	
DRLL	506	Were all disturbed areas adequately prepared for the revegetation program?	

DRLL 500	Abandonment and Reclamation - Auditor Aid	Scoring Guide
DRLL 501	Check for a copy of ERCB form E-21. EOG 8.10.2; 4.3.11	5 - approval obtained 0 - no approval
DRLL 502	Is the site aesthetically appealing; have sumps been properly treated and other wastes hauled off-site for disposal? EOG 4.3.12	5 - properly cleaned 1 - 3 partially cleaned 0 - no clean-up
DRLL 503	Regulatory guidelines require strict control of soil disturbances within and adjacent to stream crossings. Identify if soil disturbances are a concern. EOG 8.2	5 - controls implemented 1 - 3 - some controls 0 - no controls
DRLL 504	Regulatory guidelines require topsoil conservation. Inspect where topsoil and subsoil grading was required EOG 8.4.2.2; 8.5	5 no erosion 1 - 3 - some erosion 0 - severe erosion
DRLL 505	Control of erosion and the potential pollution is regulated. Identify erosion control areas with the construction supervisor and inspect for concerns. EOG 8.4.2.2; 8.5	5 - controls implemented 1 - 3 - some controls 0 - no controls
DRLL 506	Successful revegetation in part depends on seed bed preparation. The site should be inspected for soil conditions adequate for vegetation establishment. EOG 8.4.4; 8.5	5 - preparation complete 1 - 3 - some preparation 0 - no preparation

DRLL500 Abd&Rec-Code&Date

DRLL	500	Abandonment and Reclamation - Protocol	Score
DRLL	507	Were the seed varities used for revegetation compatible with existing land uses and acceptable to the goverment and the land owner?	☐
DRLL	508	Was the site properly restored, considering pre and post drilling land use.	☐
DRLL	* 509	Was the well abandoned in accordance with regulatory and industry standards?	☐
DRLL	* 510	Was a reclamation certificate issued by the government?	☐
		Total Abandonment & Reclamation score	☐

DRLL 500	Abandonment and Reclamation - Auditor Aid	Scoring Guide
DRLL 507	Revegetation is required to reach a productivity at least comparable to its undisturbed condition. An inspection may be required during vegetation establishment to determine if this condition exists. EOG 8.4.4.2; 8.5	5 - acceptable vegetation 1 - 3 - some vegetation 0 - no vegetation
DRLL 508	Look for restoration of vegetation cover, pits dried and backfilled, other holes filled. For sites where sump treatment or removal of materials will be at a later date, ensure appropriate action taken to avoid interim hazards. EOG 4.3.12	5 - proper restoration 1 - 3 partial restoration 0 - no restoration.
DRLL 509	Interview personnel and check files for comments from regulatory agencies. Verify no gas or fluids leaks at the wellhead area. EOG 4.3.11; 8.3.2; 8.10.2	5 - all standards met 1 - 3 - some standards 0 - no standards met
DRLL 510	Review documentation.	5 - certificate issued 1 - 3 certificate pending 0 - uncertifiable
	Maximum Abandonment & Reclamation score	50

PROD 1 0 0 Environmental Planning & Management

PROD	**1 1 0**	**Personnel - Protocol**	**Score**
PROD	* 111	Are environmental responsibilities written into the job description of the: (1) District Manager? (2) Area Superintendent? (3) Plant Supervisor? (4) Technical Support Personnel? (5) Construction Supervisors/Inspectors?	☐
PROD	* 112	Have employees with designated environmental responsibilities been given formal job instruction and/or specialized training?	☐
PROD	113	Have operating or facility personnel with environmental related duties completed any of the following courses: (1) Transportation of Dangerous Goods (TDG)? (2) Pesticide/Herbicide Applicators course? (3) Oil Spill Containment and Recovery? (4) Oil and Salt Water Reclamation? (5) Hazardous Material Spill Control? (6) Air Quality Monitoring? (7) Water Quality Monitoring? (8) Other courses relevant to environmental protection?	☐
PROD	114	Are there reference materials available on-site that address environmental protection issues?	☐
PROD	115	Are all facility employees aware of environmental hazards and the consequences of unsatisfactory performance?	☐
PROD	116	Is there a merit or award system at the facility which acknowledges or encourages employee initiative for the design or implementation of environmental protection measures?	☐

PROD 100 Environmental Planning & Management

PROD 110 Personnel - Auditor Aid

		Scoring Guide
PROD 111	The environmental responsibilities of the various personnel at the facility should be written in their job descriptions. The environmental responsibilities should vary according to position. Verify by checking the job descriptions.	5- written descriptions 1-3- partial 0- no descriptions
PROD 112	Review facility training program and conduct employee interviews.	5- formal training 1-3- partial 0- no formal training
PROD 113	Course success can be verified through training records and certificates. Equivalent courses are acceptable. The intent is to reward participation in environmental protection related courses.	5-all applicable courses 1-3- partial 0- no courses
PROD 114	Look for documents including regulations, guidelines, references, trade journals, and CPA and PITS availability to employees.	5- manuals on-site 1-3- partial 0- no manuals on-site
PROD 115	Training programs should include the identification of potential environmental hazards. Verify by documents and/or employee interviews.	5- programs in place 1-3- partial 0- no programs
PROD 116	Formal or informal award systems indicate management program for environmental protection. Verify by documents or employee interviews.	5- programs in place 1-3- partial 0- no programs

PROD	**110**	**Personnel - Protocol**	**Score**
PROD	117	Does the facility conduct programs to make the public aware of company procedure for prevention and control of environmental hazards.	

Total Personnel score

PROD 110		Personnel - Auditor Aid	Scoring Guide
PROD	117	Any interaction with residents that attempts to foster cooperation and understanding, such as tours, presentations, and briefings, is evidence of a good program.	5- programs in place 1-3- partial 0- no programs
		Maximum Personnel score	35

PROD	120	Procedures & Recording - Protocol	Score
PROD	* 121	Is there a formal system of recording and responding to public complaints about noise, odour, visible emissions, traffic, trespass, sulphur dusting and/or groundwater contamination?	
PROD	122	Is there an on-site system in place for recording and retrieving a wide variety of environmentally related information?	
PROD	123	Are there any land owner or land occupant water wells within a 2 km radius of the plant? If so, are they tested or monitored regularly?	
PROD	* 124	Is there a written procedure for response to, and investigation of accidents or incidents of impact to the environment?	
PROD	* 125	Do emergency and normal shut-down procedures define specific steps to prevent or minimize environmental problems?	
PROD	* 126	Are environmental protection measures incorporated into the planned repair, demolition or decommissioning of facilities?	

PROD100 EnvMgt&Plan-Code&Date

PROD	120	**Procedures & Recording - Auditor Aid**	**Scoring Guide**
PROD	121	Determine if a formal procedure for handling public complaints exists. Look for a consistent approach that includes: recording the complaint, investigating the complaint, response to the complainant, and documenting the follow-up action.	5- system in place 1-3- partial 0- no system
PROD	122	Identify if a maintenance record is available and that records are updated on a regular basis.	5- system in place 1-3- partial 0- no system
PROD	123	Review plant records and assess information.	5- regular monitoring 1-3- irregular 0- no monitoring
PROD	124	Written procedures addressing the response to and investigation of all accidents causing environmental impacts are desirable. Evidence of timely and effective handling of such incidents is desireable. Look for the following considerations to be addressed in the procedures or in reports concerning environmental impact of all accidents or incidents: environmental impact assessment, financial liability, written accounts of investigation, actions and recommendations, and follow-up by facility management.	5- written procedure 1-3- partial 0- no written procedure
PROD	125	Look for documented procedures that anticipate and mitigate potential pollution. Many safety considerations are excellent means of preventing environmental impacts. Look for environmental features in plant shut down (planned and emergency), turn-around and start-up procedures.	5- written procedure 1-3- partial 0- no written procedure
PROD	126	Review operating records, policies and procedures. The facility should have separate abandonement and decommisioning plans that set out procedures to be followed.	5- written procedure 1-3- partial 0- no written procedure

PROD 120 Procedures & Recording - Protocol **Score**

PROD * 127 Do operating records for the facility exist that record information on past: ☐
(1) facility processes?
(2) produced products?
(3) produced wastes?
(4) underground storage sites?
(5) underground disposal sites?
(6) other waste disposal data?
(7) spills of oil and hazardous chemicals?
(8) use of sterilants?

Total Procedures & Recording score ☐

PROD	120	**Procedures & Recording - Auditor Aid**	**Scoring Guide**
PROD	127	Review operating and maintenance records.	5- existing records 1-3- partial 0- no records
		Maximum Procedures & Recording score	35

PROD100 EnvMgt&Plan-Code&Date

PROD	130	Compliance - Protocol	Score
PROD	* 131	Does on-site supervision require all work (including consultants and contractors) to be in accordance with company, industry, and regulatory environmental standards?	☐
PROD	132	Is someone on the site responsible for ensuring regulatory compliance?	☐
PROD	* 133	Are copies of all current regulatory authorizations available on site?	☐
PROD	* 134	Were all regulated pollutant discharges/emissions at or below permissible levels?	☐

PROD 130	Compliance - Auditor Aid	Scoring Guide
PROD 131	Verify if consultants and contractors are supervised in the field and if they are briefed on expected environmental performance. EOG 8.10.3	5- standards applied 1-3- partial 0- no standards applied
PROD 132	Determine if arrangement is formal or informal. The type of duties are related to sampling, monitoring, lab analysis and reporting of results.	5-written description 1-3- partial 0- no description
PROD 133	Prior to conducting the audit, prepare a list of required regulatory authorizations. Verify that the lists are current and on-site, and that any changes in them are reflected in the monitoring programs and reports. Review records to determine if clean air/water reports are properly prepared and submitted.	5- all copies on-site 1-3- partial 0- no copies on-site
PROD 134	Where the response is no, proceed to answer question 137 and list non compliance events. Group similar events, but list all others individually.	5- within regulations 1-3- partial 0- non-compliance

PROD	**130**	**Compliance - Protocol**	**Score**
PROD	135	Did adverse impacts result from any non-compliance event(s)?	☐
PROD	* 136	Have remedial measures been implemented to correct the non-compliance situation?	☐
PROD	* 137	Were all spills reported to the appropriate authorities?	☐
		Total Compliance score	☐

PROD	130	Compliance - Auditor Aid	Scoring Guide
PROD	135	Use the following guide in assessing impact: MINOR - Environmental - damage that can be naturally corrected or cleaned up on the scale of hours to days. Business - business as usual; small effort/cost to correct the situation. MODERATE Environmental - even with corrective action, damage will take days to weeks to regain pre-event conditions. Business - may interupt business, involve several levels of management, and possibly significant expenditure. MAJOR - Environmental - damage that may not (or only marginally) be mitigated by corrective action, and may be of severe short term or lingering long term (weeks to months) duration for recovery. Business - results in business disruption and requires attention and intervention from high levels of management, possible long term business implications/adverse public reaction, cost over and above lost revenue, and possible litigation.	5- no adverse impacts 1-3- minor/moderate 0-major
PROD	136	When the cause of non-compliance events has been determined, verify that appropriate steps have been taken to prevent re-occurrence. Where no remedial measures have been implemented, determine if the problem has been investigated.	5-measures implemented 1-3- partial 0- no implementation
	137	Review spill report forms or other internal documentation to determine if reportable spills have been reported to the regulator. EOG 8.9.3	5- spills reported 1-3- partial 0- no spills reported

Maximum Compliance score 35

PROD	140	Monitoring - Protocol	Score
PROD	* 141	Does the facility effectively monitor regulated and non-regulated polluting substances?	☐
PROD	142	Do monitoring programs effectively assess on-site impacts of routine discharges/emissions?	☐
PROD	143	Do monitoring programs accurately assess off-site impacts of routine discharge/emissions?	☐
PROD	144	Have monitoring programs been utilized to assess the impact of spills? If yes, what was the impact of the spill(s)?	☐

PROD 140	Monitoring - Auditor Aid	Scoring Guide
PROD 141	Verify that monitoring reports are continuous (where necessary), with few gaps due to mechanical or operator failure. Determine if monitors are frequently calibrated, and quality checks run on all analysis.	5- effective monitoring 1-3- partial 0- no monitoring
PROD 142	Look for on site baseline monitoring programs such as soil and vegetation quality; soil contamination and damage investigation; and, laboratory analysis and bioassay tests on water discharge. EOG 5.3.9; 5.3.3; 7.3.3	5- effective assessment 1-3- partial 0-ineffective assessment
PROD 143	Look for off-site monitoring of waste water discharges, baseline and contamination studies of soil quality, and vegetation damage. EOG 5.3.9; 5.3.3; 7.3.3	5- effective assessment 1-3- partial 0-ineffective assessment
PROD 144	List spills that have been monitored - assess each spill individually. Use the following guide in assessing impact: MINOR - Environmental - damage that can be naturally corrected or cleaned up on the scale of hours to days. Business - business as usual; small effort/cost to correct the situation. MODERATE - Environmental - even with corrective action, damage will take days to weeks to regain pre-event condition. Business - may interupt business, involve several levels of management, and possibly significant expenditure. MAJOR- Environmental - damage that may not (or only marginally) be mitigated by corrective action, and may be of severe short term or lingering long term (weeks to months) duration for recovery. Business - results in disruption and requires attention and intervention from high levels of management, possible long term business implecations, adverse public reaction, cost over and above lost revenue, and possible litigation.	5- effective monitoring 1-3- partial 0-ineffective monitoring

PROD	140	Monitoring - Protocol	Score
PROD	* 145	Did the company conduct special monitoring programs prior to the closure/abandonment of disposal sites, underground tanks, lagoons, evaporation ponds, flare pits, or landfill sites?	
PROD	* 146	Have remedial measures been implemented where assessment data indicate a likely adverse impact?	
PROD	147	Have revegetation, restoration and erosion control programs been successful?	
PROD	148	Have habitat protection measures been effective?	

Total Monitoring score

Total Environmental Management & Planning score

PROD 140	Monitoring - Auditor Aid	Scoring Guide
PROD 145	If such facilities were abandoned, look for short or long term monitoring programs to determine if a problem may arise. EOG 8.10.3	5- programs in place 1-3- partial 0- no programs
PROD 146	Where monitoring has indicated a problem, verify that remedial programs have been designed and implemented.	5- implemented 1-3- partial 0- no implentation
PROD 147	Evaluate these efforts against surrounding environment and aesthetic values. Inspect specific recorded sites. EOG 8.4.2; 8.4.4; 8.5	5- successful programs 1-3- partial success 0- no success
PROD 148	Look for evidence of dead wildlife, abandoned nesting sites or reduced populations. EOG 8.1; 8.2; 8.3; 8.6	5- effective measures 1-3- partially effective 0- no measures

Maximum Monitoring score 40

Maximum Environmental Management & Planning score 145

PROD 200 General Operating Procedures

PROD	210	Wellsite and Flowlines - Protocol	Score
PROD	211	Is there evidence of effective erosion control programs?	☐
PROD	212	Is there evidence of a vegetation management program?	☐
PROD	213	Are mechanical methods of weed control attempted before using chemical methods?	☐
PROD	214	Is brush control practiced on all flow, injection, and group lines?	☐
PROD	215	Have reclamation/revegetation programs been successful?	☐
PROD	* 216	Are there appropriate and consistent monitoring programs of wells and flowlines, to visually detect spills or leaks?	☐
PROD	* 217	Are there remote detection systems in place to detect spills and leaks from flowlines?	☐

PROD 200 General Operating Procedures

PROD 210 Wellsite and Flowlines - Auditor Aid

		Scoring Guide
PROD 211	Look for control of surface run-off, proper culvert maintenance, slope stabilization, and siltation in lakes, rivers, and streams.	5- clear evidence 1-3- partial 0- no evidence
PROD 212	Check vegetation on and adjacent to the lease, access roads, and associated flow, injection, and group lines. Look for excessive weed infestation and poor vegetation cover. This condition may enhance soil erosion. Also look for use of soil sterilants; they should be avoided.	5- clear evidence 1-3- partial 0- no evidence
PROD 213	Chemical programs are costly, and can lead to off-lease impacts from spills and run-off. Verify by interviewing operations personnel.	5- all mechanical 1-3- partial 0- no mechanical
PROD 214	Check for encroachment of brush over ROW's, and for remedial mesasures that ensure access to, and surveillance of all lines.	5- good brush control 1-3- partial 0- no brush control
PROD 215	Look for results of these programs at locations of all construction operations and sites of oil, brine, and chemical spills. Verify that the programs have produced aesthetically pleasing results, and that the landowners and regulators are satisfied.	5- programs successful 1-3- partial 0-programs unsuccessful
PROD 216	Determine the frequency of inspection/surveillance and weigh against the type of facility, natural/design containment, response capability, and potential environmental impacts.	5- programs in place 1-3- partial 0- no programs
PROD 217	Look for evidence of low pressure alarms or other systems that detect abnormal operating conditions.	5- systems in place 1-3- partial 0- no systems

PROD	210	Wellsite and Flowlines - Protocol	Score
PROD	* 218	Are spill events assessed in an effort to design remedial measures?	☐
PROD	* 219	Are wellheads and exposed casing properly marked and protected against accidental impact and vandalism?	☐

PROD 210	Wellsite and Flowlines - Auditor Aid	Scoring Guide
PROD 218	Look for evidence that recurring spill events have led to design and implementation of programs to prevent spills (ie. line replacement or re-enginnering of surface installations).	5- complete assessment 1-3- partial 0- no assessment
PROD 219	Look for fencing (including state of repair) where necessary, and chaining/bullplugging of the wellheads. Properly marked wellheads aid non-company personnel when reporting abnormal events.	5- complete protection 1-3- partial 0- no protection

PROD	**220**	**Wellsite and Flowlines - Protocol**	**Score**
PROD	* 220	Have spill prevention measures been implemented?	
PROD	* 221	Are access and control points selected for spill containment and recovery areas?	
PROD	222	Are there cellars covered with grates, to contain small spills from the wellhead?	
PROD	223	Have leases been cleared of debris, unused buildings, and equipment?	
PROD	224	Are accesses to sensitive company operations or ecologically important areas controlled?	
PROD	225	Are suspended wellsites/flowlines maintained in the same fashion as the operating facilities?	
PROD	226	Are efforts made to minimize lease size, keeping in mind possible workover and maintenance requirements?	
PROD	227	Where flare pits are still adjacent to the wellheads, are they properly maintained?	
PROD	228	Has odor been a problem at the wellhead; have remedial measures been taken?	

PROD	220	Wellsite and Flowlines - Auditor Aid	Scoring Guide
PROD	220	Look for dyking and contouring of leases to contain oil spills, and racking of drums as examples of spill prevention.	5-measures implemented 1-3- partial 0- no implementation
PROD	221	Check if they are always or seasonally accessible? Do potential liabilities warrant the construction of better access/control points?	5- proper points selected 1-3- questionable 0- unsatisfactory access
PROD	222	Inspect locations and determine if cellars exist, and if so, are they being properly manintained?	5- cellars/maintained 1-3- partial 0- no cellars
PROD	223	Aesthetics are important especially near public roads and residential area. Debris removal reduces the chance of injury and equipment loss, and litigation.	5- leases cleaned 1-3- partial 0- unsatisfactory
PROD	224	Look for gates or other obstacles that afford the necessary protection.	5- controlled access 1-3- partial 0- access not controlled
PROD	225	Look for good vegetation control, spill prevention, and access maintenance.	5- adequate maintenance 1-3- partial 0- no maintenance
PROD	226	Smaller leases are less costly to maintain, and may return more land to the landowner.	5- minimum lease sizes 1-3- partial 0- oversized leases
PROD	227	Look for fencing where necessary, oil, water ponding, and vegetation control.	5- proper maintenance 1-3- partial 0- insatisfactory
PROD	228	Where odor has been a problem, have complaints been investigated and corrective action taken?	5- no odor problems 1-3- partial 0- uncorrected problems

PROD	**220**	**Wellsite and Flowlines - Protocol**	**Score**
PROD	229	Is there an on-going program to evaluate the possibility of formally abandoning wells that are suspended or capped?	☐

Total Wellsite & Flowline score ☐

PROD	220	Wellsite and Flowlines - Auditor Aid	Scoring Guide
PROD	229	Suspended/capped wells pose a greater potential source of liability than properly certified abandoned wells.	5- program in place 1-3- partial 0- no program
		Maximum Wellsite & Flowline score	190

PROD	230	Process - Protocol	Score
PROD	* 231	Do emergency operating procedures exist for the periods when maximum authorized air quality regulations are violated?	
PROD	* 232	Are all pressure relief systems vented to a Vapour Recovery Unit or the flare stack (excluding air and steam)?	
PROD	233	Is there noticeable odor emanating from any operations at the facility?	
PROD	234	Are vapours from sulphur storage and handling facilities collected and burned?	
PROD	235	Are gases purged from tank cars, tanker trucks or other purged vessels returned to process or burned?	
PROD	236	Are regeneration gases collected and burned?	
PROD	237	Does the routing of gas as described in 232, 235, and 236 increase visible smoke from the flare?	
PROD	238	a) Did all black smoke emissions receive prior approval of the Board? b) If no, were all other black smoke emissions reported?	
PROD	* 239	Is all air monitoring equipment operational and well maintained?	

PROD 230	Process - Auditor Aid	Scoring Guide
PROD 231	Procedures for alerting operations staff and regulatory authorities of a violation, internal reporting, and technical considerations should be documented.	5- written procedures 1-3- partial 0- no procedures
PROD 232	Gases should be redirected to the process Vapour Recovery Unit or to a flare. Check operations manual for confirmation. EOG 5.3.9; 7.3.3	5- no atmospheric vents 1-3- partial 0- atmospheric venting
PROD 233	Check for odour especially at distance from the plant. Check files for public complaints. Determine if odour source is known and if corrective steps are being taken. EOG 5.3.8; 5.3.9; 7.3.3	5- no odors 1-3- minor odors 0- uncorrected problems
PROD 234	Systems that collect sulphur vapours and direct them to the flare or incinerator are preferred. EOG 5.3.8; 5.3.9;	5- collected & burned 1-3- partial collection 0- no collection
PROD 235	Verify through review of process drawings, physical inspection and interview. EOG 5.3.8; 7.3.3	5- processed & burned 1-3- partial collection 0- no collection
PROD 236	Regeneration gases from glycol, raw gas, and LPG sweetening systems should be collected and sent to the flare. Check with operating personnel and inspect site.	5- processed & burned 1-3- partial collection 0- no collection
PROD 237	If air emissions are routed to the flare, determine by interview or observation the effect on visible smoke. If it is a problem, are alternate methods being investigated?	5- no visible effect 1-3- minimal effect 0- major visible effects
PROD 238	Check records for black smoke events, and verify that prior approvals were received. Verify that non-approved black smoke emissions were reported.	5- prior apoproval 1-3- reported 0- no prior approval
PROD 239	Examine on-site and off-site equipment. Determine down time due to equipment failure and accuracy of results. Determine if equipment has annual maintenance and calibration checks.	5- satisfactory 1-3- partial 0- unsatisfactory

PROD200 GenOpProc-Code&Date

PROD	240	Process - Protocol	Score
PROD	240	Are the monitoring devices connected to the control room by an alarm system or telemetry?	
PROD	241	Is the flare stack visible from the control room?	
PROD	242	Have there been instances when the flare has unexpectedly been extinguished; has the cause been determined and corrective action taken?	
PROD	243	Have there been instances when liquids have been observed/detected escaping from the top of the flare stack?	
PROD	244	Are measures taken to control sulphur dust?	

Total Process score

PROD	240	Process - Auditor Aid	Scoring Guide
PROD	240	Look for measures to alert operators to emission violations.	5- alarms in place 1-3- partial 0- no alarms in place
PROD	241	In the absence of real time sensors on the flare stack or in the vicinity, observation may be the only warning of a problem.	5- flare visible 0- flare not visible
PROD	242	Loss of the flare can result in serious non-compliance and/or potentially hazardous concentrations of noxious and/or flammable gases.	5- no flare loss 1-3- loss/cause determined 0- undetermined loss
PROD	243	This is an indication of a process problem that could have serious implications. The cause should have been determined immediately, and corrective action taken. EOG 5.3.8	5- no instances 1-3- minor/determined 0- undetermined causes
PROD	244	Look for methods of preventing vehicular traffic on the block and non-mechanical means of removing the block Look for other methods that indicate efforts are being made. EOG 5.3.8	5- dust control evident 1-3- partial 0- no dust control effort

Maximum Process score 165

PROD	250	Product Storage and Loading - Protocol	Score
PROD	* 251	Are all product storage areas contained within properly sized and impermeable dykes?	
PROD	252	Are storage and handling sites properly separated from other facility operations and off-lease improvements?	
PROD	* 253	Are venting and/or overflow systems installed and functioning?	
PROD	254	Is there oil stored in open pits; is it approved, and if so, are the pits fenced off?	
		Total Product Storage & Loading score	

PROD200 GenOpProc-Code&Date

PROD 250	Storage and Loading - Auditor Aid	Scoring Guide
PROD 251	Inspect and measure dykes. Review design plans for capacity of storage vessels. EOG 5.3.6	5- proper dykes. 1-3- partial 0- no dykes
PROD 252	Inspect site. EOG 5.3.6	5- adequate separation 1-3- partial separation 0- inadequate separation
PROD 253	Inspect site. All vents should be directed to a reproccessing unit or to the flare stack. EOG 5.3.6	5- proper systems 1-3- partial 0-inadequate/no systems
PROD 254	Inspect site. Review approval documentation. EOG 5.3.6	5-pits approved/fenced 1-3- partial 0-unapproved/unfenced
	Maximum Product Storage & Loading score	20

PROD	**260**	**Aesthetics - Protocol**	**Score**
PROD	* 261	Does the facility have a vegetation management plan?	☐
PROD	262	Are selective non-residual herbicides applied by licenced applicators/contractors?	☐
PROD	* 263	Are records kept of all applications of herbicides?	☐
PROD	* 264	Are adequate berms and other measures in place to prevent off-lease run-off of herbicides and other chemicals?	☐
PROD	265	Are landscaped areas of the facility (lawns, flower beds etc.) protected from disturbances and contamination from operating and maintenance acitivity?	☐
PROD	266	Are facility signage, sidewalks, fences and buildings maintained, painted and pleasing in appearance?	☐
PROD	267	Is there good housekeeping in the sulphur block, drum and pipe storage, tank farm, and pit and lagoon areas?	☐
PROD	268	Is the entire facility kept clean and tidy?	☐

Total Aesthetics score ☐

PROD 260	Aesthetics - Auditor Aid	Scoring Guide
PROD 2[illegible]	Check for a plan and implementation by inspection.	5- plan in place 1-3- partial 0- no plan
PROD 262	Check for use of soil sterilants, and any resulting contamination. Review records for types of chemicals. EOG 8.11	5- proper application 1-3- partial 0- improper use
PROD 263	Records of the type of herbicide, date, location and application rate should be available on site. EOG 8.11	5- complete records 1-3- partial 0- no records
PROD 264	Inspect topography and natural run-off areas. Determine if the existing berms are adequate. Compare vegetation on both sides of berm. EOG 8.11	5- adequate berms 1-3- partial 0- inadequate berms
PROD 265	Verify by inspection. Subject to spills or deposition.	5- adequate protection 1-3- partial 0- inadequate protection
PROD 266	Check for program of grounds and building maintenance. Audits conducted in winter or spring should be more subjective.	5- adequate maintenance 1-3- partial 0-inadequate maintenance
PROD 267	It is important for the blocks to be neat in appearance. The area around the block and the loading area should be free of dust.	5- adequate maintenance 1-3- partial 0-inadequate maintenance
PROD 268	The visual impact of a facility can influence the attitude of employees, inspectors and the public. Poor aesthetics detract from otherwise adequate facility. There should be no idle equipment or materials indiscriminately stored.	5- good aesthetics 1-3- minor problems 0- poor aesthetics
	Maximum Aesthetics score	40

PROD	270	Water Supply - Protocol	Score
PROD	* 271	Were all required regulatory water use authorizations obtained? If so were copies on-site?	
PROD	272	Was water quality tested and records kept?	
PROD	273	Was water consumption monitored and recorded?	
PROD	274	Were water treatment programs recorded?	
PROD	275	Where surface waters were the source, were water balance calculations made and recorded?	

Total Water Supply score

Total General Operating Procedures score

PROD 270		Water Supply - Auditor Aid	Scoring Guide
PROD	271	Review plant records, see if authorizations are posted and are current. EOG 5.3.10; 8.6.2; 7.3.4	5- authorizations posted 1-3- partial 0- no authorizations
PROD	272	Review plant records. EOG 5.3.10; 8.6.2; 7.3.4	5- test records kept 1-3- partial 0- no tests/records
PROD	273	Review plant records and authorization conditions. EOG 5.3.10; 7.3.4	5- complete records 1-3- partial 0- no records
PROD	274	Review plant records. EOG 5.3.10; 7.3.4	5- complete records 1-3- partial 0- no records
PROD	275	Review plant records. EOG 5.3.10; 7.3.4	5- complete records 1-3- partial 0- no records
		Maximum Water Supply score	25
		Maximum General Operating Procedures score	440

PROD 300 Spill Prevention & Emergency Response

PROD 310 Spill Prevention - Protocol

			Score
PROD	311	Do on-site spill prevention and control methods and equipment provide: (1) Leak prevention in storage and transfer facilities? (2) Primary containment (tanks, sumps, dykes, drainage)? (3) Secondary containment (ditches, lagoons, pits)? (4) Emergency containment (sandbags, pumps, absorbants)? (5) Safety valve and rupture disk discharge systems? (6) Emergency venting, purging and bypass systems?	☐
PROD	* 312	Are frequent formal surveys made to identify the need for spill prevention control methods and equipment?	☐
PROD	313	Have any of the survey results been implemented?	☐
PROD	* 314	Have devices been installed to detect losses, leaks and/or spills from any above ground or underground installations?	☐
PROD	315	Is the level of emergency planning consistent with the degree of risk or possible environmental impairment?	☐
PROD	* 316	Is the response capability sufficient to handle anticipated spills, releases, or other incidents?	☐
		Total Spill Prevention score	☐

PROD 300 Spill Prevention & Emergency Response

PROD 310	Spill Prevention -Auditor Aid	Scoring Guide
PROD 311	Each of the six must be assessed for process, storage, loading and transportation activities at each facility. Contractors' equipment must be considered when evaluating the adequacy of the entire system. EOG 5.3.12	5- completely adequate 1-3- partial 0- inadequate
PROD 312	Changes in facilities, operating guidelines, government regulations, and company policy may necessitate a modification in equipment and procedures. Modifications should be documented. Previous audits may constitute such a review. EOG 5.3.12	5- annually 1-3- every 2 to 3 years 0- never
PROD 313	Determine if any recommendations have been implemented through interview, inspection of facility or records.	5- implemented 1-3- partial 0- not implemented
PROD 314	Detection devices that raise an alarm or that require an active response are most desirable. Devices that indicate a loss during routine inspection are acceptable only if there is evidence that the level of inspection is consistent with volume and hazard of the material in question. EOG 5.3.12	5- detectors in place 1-3- partial 0- no detectors
PROD 315	Review hazards, liabilities, and obstacles facing response personnel; compare with preparations as explained in the response plans.	5- adequate preparation 1-3- partial 0- inadequate
PROD 316	Compare requirements of response plans to resources (equipment/personnel) with knowledge/ability of response organization.	5- adequate capability 1-3- partial 0- inadequate capability
	Maximum Spill Prevention score	30

PROD	**320**	**Spill Response - Protocol**	**Score**
PROD	* 321	Is there a spill response plan for this facility?	
PROD	322	Does the company belong to mutual aid organizations to support in-house response efforts?	
PROD	* 323	Is a copy of the spill plan available on-site, and are personnel familiar with the plan and procedures?	
PROD	* 324	Does the spill response plan include specific responsibilities for response and control activities?	
PROD	* 325	Do company personnel and contractors participate in training or drills to improve the response efficiency of company and mutual aid organizations?	
PROD	* 326	If deficiencies were noted, or recommendations made arising out of an exercise, were they corrected or implemented?	
PROD	327	Is there a designated spokesperson, trained for emergency response situations, to respond to regulatory agencies, the media and the public?	
PROD	328	Are details of previous spills and other related data relative to product storage and transfer sites available for use in planning for future facility decommissioning?	
PROD	329	Have spill response plans been prepared for the route of products moved by road?	
		Total Spill Response score	

PROD	320	Spill Response - Auditor Aid	Scoring Guide
PROD	321	Check for written company specific plan and/or oil spill co-operative plan. EOG 8.9.3	5- written plan 1-3- partial 0- no plan
PROD	322	Specifically, oil spill cooperatives or qualified contractors/consultants on location. Check for written proof of activity. EOG 8.9.3	5- active member 1-3- inactive member 0- not a member
PROD	323	Locate copy and through interview, determine the level of knowledge and ability to successfully implement. EOG 8.9.3	5- on-site plan/familiar 1-3- partial 0- no plan
PROD	324	The plan should list and assign specific control and clean-up duties. EOG 8.9.3	5- set responsibilities 1-3- partial 0-responsibilities not set
PROD	325	Verify through interview of company or cooperative personnel.	5- active participation 1-3- partial 0- no participation
PROD	326	Verify through interview and/or files that appropriate changes were made.	5- implemented 1-3- partial 0- not imlemented
PROD	327	Review emergency response plans. Interview appropriate people about training and responsibilities. EOG 8.9.3	5- designated position 1-3- partial 0- no designation
PROD	328	Review baseline survey (if available), previous files, or interview facility personnel. EOG 8.10.3	5- details available 1-3- partial 0- no details available
PROD	329	Review company and contractor plans, interview personnel, and determine relative risk of transportation routes.	5- plans prepared 1-3- partial 0- no prepared plans

Maximum Spill Response score 45

PROD	**330**	**H2S Planning and Response - Protocol**	**Score**
PROD	331	Does the emergency response plan describe the possible evacuation scenarios as H2S levels increase?	
PROD	332	Is there a current residents list and contact numbers; have evacuation plans been discussed with residents?	
PROD	* 333	Has a major exercise of the H2S emergency response plan involving field and headquarters personnel been conducted?	
PROD	* 334	If there were deficiencies noted or recommendations made arising out of an exercise, were they corrected or implemented?	
PROD	335	Are there clear statements/criteria regarding the decision to ignite a sour gas well?	
PROD	336	Has the decision making for ignition been delegated to field (on-site) personnel, to prevent delays?	

Total H2S Planning & Response score

Total Spill & Emergency Response score

PROD	330	H2S Planning and Response - Auditor Aid	Scoring Guide
PROD	331	Check documents for activation sequences. EOG 4.3.9.1	5- scenarios described 1-3- partial 0- no plan
PROD	332	Check for document; verify numbers if possible. Verify consultation with residents and ability to contact during an emergency.	5-current list/discussed 1-3- partial 0- no list or discussions
PROD	333	Determine if exercise occurred; verify that communications were tested and on-site and off-site personnel were exercised.	5- major exercise 1-3- partial 0- no exercise
PROD	334	Verify through interview and/or files that appropriate changes were made.	5- implemented 1-3- partial 0- not implemented
PROD	335	Review emergency response plan and company procedure manuals. Make sure regulatory requirements are noted. EOG 4.3.9.1	5- clear statement 1-3- partial 0- no clear statment
PROD	336	Review emergency response plan and job description. Verify understanding of designated field person. Determine if there is disagreement between company and contractor positions.	5- on-site designation 1-3- partial 0- off-site designation

Maximum H2S Planning & Response score	30
Maximum Spill & Emergency Response score	105

PROD 400 Waste Management

			Score
PROD	410	Operating Procedures - Protocol	
PROD	* 411	Are copies of all regulatory authorizations for plant waste disposal readily available to plant personnel?	
PROD	412	Were all waste managment practices in accordance with regulatory legislation?	
PROD	413	Are records maintained as to waste type, volume, originating source, and disposal method and location?	
PROD	414	Has a hazardous waste/dangerous goods inventory been conducted at the facility?	
PROD	* 415	Are all wastes being handled in accordance with the procedures set out in the CPA Environmental Operating Guidelines?	
PROD	416	Does the facility recycle waste materials, including waste water?	
PROD	* 417	Has the facility considered the use of less toxic and unregulated chemicals as alternatives to toxic/regulated products currently in use?	
PROD	418	Have oil spill debris been properly stored, treated and disposed of?	

PROD 400 Waste Management

PROD 410	Operating Procedures - Auditor Aid	Scoring Guide
PROD 411	Prior to the audit, check authorizations required for wastes and waste diposal activities on and off-site. Ensure the authorizations are current and copies are on-site.	5-authorizations on-site 1-3- partial 0- not on-site
PROD 412	Interview personnel and check files for waste management activities. Verify that manifesting procedures are correct. Determine causes of unacceptable practices. EOG 5.3.7.1	5- correct procedures 1-3- partial 0- all incorrect
PROD 413	Look for records of manifest forms, purchase orders, design and contractor documents.	5- full records 1-3- partial 0- no records
PROD 414	Inspect plant waste records and inventory reports.	5- inventory conducted 1-3- partial 0- no inventory
PROD 415	Review EOG, 5.3.7.1, 5.3.7.2	5- correct procedures 1-3- partial 0- all incorrect
PROD 416	Look for programs that recognize and reward efforts at waste reduction or recycling.	5- reclycling program 1-3- partial 0- no program
PROD 417	Such initiatives reduce potential liability related to discharges and spills. Look for feasibility studies, pilot projects or actual implementation.	5- consideration given 1-3- partial 0- not considered
PROD 418	For facilities with spills since the last audit, review reports for problems and successes. For facilities without spills, look for plans on how to handle oil spill debris.	5- proper procedures 1-3- partial 0- improper procedures

PROD	**410**	**Operating Procedures - Protocol**	**Score**
PROD	419	Have remedial measures been implemented to correct any non-compliance situations?	☐

Total Operating Procedures score ☐

PROD 410	Operating Procedures - Auditor Aid	Scoring Guide
PROD 419	Verify that remedial measures have been implemented through interview and review of plant records.	5- imlemented 1-3- partial 0- not implemented

Maximum Operating Procedures score 45

PROD 4 2 0 Dangerous Goods - Protocol

PROD	* 421	Are off-site measures such as vehicle inspections, route planning, and evaluation of transporter compliance to regulations, used to minimize risks associated with transportation of dangerous or hazardous goods?	☐
PROD	* 422	Are labels, placards and manifests (company and special) available on site for the storage, handling and movement of wastes?	☐
PROD	* 423	Are all personnel handling dangerous goods/hazardous wastes trained and certified?	☐
PROD	424	Are all shipments of dangerous goods/hazardous wastes into and out of the facility (including the production fields), appropriately contained and labelled?	☐
PROD	* 425	Are chemicals properly stored in appropriately labelled containers?	☐
PROD	* 426	Are MSDS sheets readilly available for all chemical products stored and handled at each facility?	☐
PROD	427	Is protective equipment, first aid supplies, and other response material readily available to support routine or emergency situations.	☐
PROD	* 428	Have any on-site personnel taken a certified hazardous materials spill course or a refresher course in the last 2 years?	☐
		Total Dangerous Goods score	☐

PROD 420	Dangerous Goods - Auditor Aid	Scoring Guide
PROD 421	Determine by interview and review of dangerous goods management files if extraordinary measures are taken to identify risks and select better alternatives.	5- proper measures 1-3- partial 0- improper measures
PROD 422	Check supplies of all materials. Verify that a system is in place to re-order stock and determine which labels/placards are required.	5- available on-site 1-3- partial 0- not available on-site
PROD 423	Determine which personnel are required to handle dangerous/hazardous materials. Verify that personnel have up-to-date TDG certificate and in-house training.	5- adequate training 1-3- partial 0- inadequate training
PROD 424	Check or observe shipment procedures.	5- proper procedures 1-3- partial 0- improper procedures
PROD 425	Inspect chemical storage facility and verify storage labelling.	5- proper procedures 1-3- partial 0- improper procedures
PROD 426	Document products stored on site. Verify MSDS sheets are available.	5- readily available 1-3- partial 0- not available
PROD 427	Review MSDS sheets or other information source to determine if appropriate equipment is available. EOG 8.11.2	5- readily available 1-3- partial 0- not available
PROD 428	Review staff training files, or interview appropriate personnel.	5- yes/ < 2 years 1-3- yes/> 2 years 0- no courses taken
	Maximum Dangerous Goods score	40

PROD	**430**	**Liquid Wastes - Protocol**	**Score**
PROD	* 431	Is plant waste water routinely analyzed prior to disposal?	
PROD	* 432	Does waste water from floor washings and liquids collected from spills and leaks in plant buildings (around pumps, vessels, etc.), flow through the waste water treatment and disposal system?	
PROD	* 433	Does runoff water from non-process areas collected in drains, ditches, troughs and other run-off collection systems flow into a tank or ponds?	
PROD	* 434	Are evaporation ponds, lagoons or other waste water impoundments, lined with impervious material (clay, PVC, concrete etc) to prevent groundwater contamination?	
PROD	* 435	Are records kept of the location and contents of each above ground and underground waste water storage vessel, lagoon or pond?	
PROD	436	Is sulphur block drainage or run-off water sampled, analysed, and treated prior to discharge into a watershed or surface water body (creek, ponds etc)?	
PROD	437	Is plant sewage treated or disposed of in a manner that does not contaminate surface water or groundwater?	
PROD	438	Are the waste waters from cooling tower blowdown or boilers treated and disposed of by environmentally safe methods?	
		Total Liquid Waste score	

PROD	430	Liquid Wastes - Auditor Aid	Scoring Guide
PROD	431	Verify by review of records or operating manual. Check conditions of regulatory authorizations. Rate disposal method and assign index.	5- complete analysis 1-3- partial 0- no analysis
PROD	432	Trace possible routes of washings and collected spills. Discuss with personnel. Look for ways the system can be bypassed and discharges made to the environment.	5- no treatment bypass 1-3- partial 0- improper bypass
PROD	433	Inspect the course and termination of drains and ditches to determine fate of collected water.	5- no treatment bypass 1-3- partial 0- improper bypass
PROD	434	Check engineering drawings and interview personnel. Baseline audit may also contain details. Check recommendations from previous audits to ensure they have been implemented.	5- imperveous material 1-3- partial 0- inadequate material
PROD	435	Check current facility files.	5- complete records 1-3- partial 0- no records
PROD	436	Identify routes of surface runoff, verify with company personnel and review documented analysis done on a routine basis.	5- full treatment 1-3- partial 0- no treatment
PROD	437	Determine what type of system is in place. Primary treatment is acceptable. Check maintenance program for any treatment system. Analysis of fecal coliforms should be carried out in any monitoring program.	5- no contamination 1-3- partial 0- unacceptable contamination
PROD	438	There are various methods of treating these waters; phosphate conditioners are preferable to chromate or zinc products. Storage should normally be in imperveous ponds or tanks. Deep well injection is the preferred method.	5- acceptable disposal 1-3- partial 0- unacceptable disposal

Maximum Liquid Waste score 40

PROD	**440**	**Solid Wastes - Protocol**	**Score**
PROD	441	Are all drums (empty, full or partially filled) stored, handled, and disposed of in such a way as to minmize the risk of spills and environmental damage?	☐
PROD	* 442	Are solid wastes segregated into separate containers or bins prior to disposal?	☐
PROD	443	Is the site free of randomly discarded solid wastes?	☐
PROD	444	Are holding pond sludges handled in a satisfactory manner?	☐
PROD	445	Are the evaporation ponds and burn pits well maintained?	☐
PROD	446	Has the sludge generated during water recycling operations been disposed of in an environmentally acceptable manner?	☐
PROD	448	Has the sand collected in the "ecology pits" been disposed of in a safe manner, and monitored, if applied on private or public roads?	☐

Total Solid Wastes score ☐

Total Waste Management score ☐

PROD	440	Solid Wastes - Auditor Aid	Scoring Guide
PROD	441	Drums should be stored on racks in an area that has a berm, is fenced and lined with PVC or other impermeable material. The drums should have bungs in place and be stored upright. Check disposal procedures for drum rinse water. Drums should be sent to an approved receiver.	5- proper storage 1-3- partial 0- improper storage
PROD	442	Inspect waste containers and verify wastes separated (combustibles, recyclables, reclaimables).	5- complete segregation 1-3- partial 0- no segregation
PROD	443	Inspect site.	5- proper storage 1-3- partial 0- improper storage
PROD	444	Holding pond sludges may contain acidic or alkaline water. They should be treated prior to disposal. Verify through observation, review of operating procedures, manuals, and interviews.	5- proper handling 1-3- partial 0- improper handling
PROD	445	Verify through inspection that the ponds/pits are free of debris, vegetation etc. that might interfere with the operation.	5- adequate maintenance 1-3- partial 0-inadequate maintenance
PROD	446	Review laboratory analyses of the wastes and. disposal method.	5- acceptable disposal 1-3- partial 0- unacceptable disposal
PROD	448	Verify by checking monitoring data.	5- acceptable disposal 1-3- partial 0- unacceptable disposal

Maximum Solids Wastes score	35
Maximum Waste Management score	160

PROD	500	Abandonment and Reclamation - Protocol	Score
PROD	* 501	Was the necessary abandonment approval obtained?	☐
PROD	* 502	Was the facility abandoned in accordance with regulatory and industry standards?	☐
PROD	503	Was the site properly cleaned of trash, wastes, waste oils, other debris and unseen hazards such as unused chemicals?	☐
PROD	504	Were all disturbed areas adequately prepared for the revegetation program?	☐
PROD	505	Was topsoil and subsoil material adequately restored to prevent soil erosion?	☐
PROD	506	Were berms and cross dykes constructed across graded slopes to prevent soil erosion?	☐
PROD	507	Were the seed varieties used for revegetation compatible with existing land uses and acceptable to the goverment and the land owner?	☐
PROD	508	Was the site properly restored, considering pre and post land use.	☐

Total Abandonment & Reclamation score ☐

PROD500 Abd&Rec-Code&Date

PROD	500	Abandonment and Reclamation - Auditor Aid	Scoring Guide
PROD	501	Check production records. Has a certificate of reclamation been applied for or recieved.	5- certificate obtained 1-3- partial 0- no approval
PROD	502	Interview personnel and check files for comments from regulatory agencies.	5- approved standards 1-3- partial 0- no standards met
PROD	503	Is the site aesthetically appealing; have sump wastes been properly treated and disposed of and other wastes hauled off-site for disposal?	5- proper restoration 1-3- partial 0- improper restoration
PROD	504	Successful revegetation depends on seed bed preparation. The site should be inspected for soil conditions adequate for vegetation establishment. EOG 8.4.4; 8.5	5- adequate preparation 1-3- partial 0- inadequate prepartion
PROD	505	Regulatory guidelines require topsoil conservation. Inspect where topsoil and subsoil grading was required and determine if problems exist. EOG 8.4.2.2; 8.5	5- adequate conservation 1-3- partial 0- inadequate
PROD	506	Control of erosion and potential pollution is regulated. Identify erosion control areas with the field supervisor and inspect for concerns. EOG 8.4.2.2; 8.5	5- proper methods 1-3- partial 0- unsatisfactory
PROD	507	Revegetation is required to reach a productivity at least comparable to its undisturbed condition. An inspection may be required to determine if this condition exists.	5- compatible seed 1-3- partial 0- incompatible seed
PROD	508	Look for restoration of vegetation cover, pits dried and backfilled, other holes filled. For sites where sump treatment or removal of materials will be at a later date check for adequate storage area.	5- proper restoration 1-3- partial 0- improper restoration

Maximum Abandonment & Reclamation score 40